



# JOURNAL

## OF THE

# AMERICAN

# PHARMACEUTICAL

# ASSOCIATION

TRADE MARK

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# H O L A D I N

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**DR. ROBERT HEILIG LIC. N.Y.**

C.M.S. MEDICAL COLLEGE

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No 1

## EDMUND NORRIS GATHERCOAL

Edmund Norris Gathercoal was born near Sycamore, Illinois, in 1874. His father's people were English, his paternal grandfather having come to this country from southern England in 1857, while on his mother's side his ancestry is Pennsylvania Dutch.

Shortly after the boy completed his high school education his family moved to Chicago, where in 1891 young Gathercoal entered the drug store of T. W. Sollitt as an apprentice. Mr. Sollitt was a well-trained pharmacist and a graduate of the Chicago College of Pharmacy. Soon the boy became fired with ambition to qualify as his employer had done and in 1893 he entered upon his studies in the Chicago College of Pharmacy, now the College of Pharmacy of the University of Illinois. He was graduated at the head of his class in 1895. It is an indication of his later interest in pharmacognosy and botany that upon graduation he was awarded a microscope as a prize for his proficiency in these branches. Soon thereafter the young man entered Rush Medical College but after completing the sophomore year he was compelled by adverse circumstances to give up his medical course.

Within two years, however, the ambitious drug clerk established a business at Wilmette, a suburb of Chicago, where he conducted a prosperous pharmacy for eight years. He retained his interest in the College, which meanwhile had become the School of Pharmacy of the University of Illinois, and in 1907 he disposed of his successful drug business and accepted a full-time teaching position on the faculty of the School, where he has been successively advanced from instructor to full professorship in his favorite subject, pharmacognosy.

Professor Gathercoal has made frequent contributions to pharmaceutical literature, many of which have appeared in the JOURNAL. In 1915, he was awarded the Ebert Prize for his paper on "The Pharmacognosy of the Medicinal *Rhamnus Barks*." His reports of the meetings of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION extending over a period of fifteen years are models of brevity and clearness. He was assistant editor of the pharmacognosy section of *Botanical Abstracts* for several years and has served creditably on the Revision

Committee of the United States Pharmacopœia, both tenth and eleventh revisions, as a member of the Committee on Botany and Pharmacognosy. He has been chairman of the Committee of Revision of the National Formulary since 1929 and has done a splendid piece of work in the preparation of the N. F. VI. He has been president of the National Conference on Pharmaceutical Research since 1929. He was active in the formation of the International Color Council and its chairman for several years. He has served the AMERICAN PHARMACEUTICAL ASSOCIATION as vice-president and as a member of important committees. He is co-author of a well-known text in pharmacognosy and has written more than a hundred papers that have been published in pharmaceutical journals. In 1934, the Philadelphia College of Pharmacy conferred on him the honorary degree of Master in Pharmacy.

The distinguishing traits of the subject of this sketch are earnestness, industry and perseverance. With these he combines a broadness of view and a consideration for the feelings of others, which have made for him many warm friends. His well-founded religious convictions have aided him to face misfortune bravely and to take a sane view of life.

In 1899, Professor Gathercoal was married to Miss Cordelia M. Poole, and three children, Marion, Norris and Jean, have resulted from this union.—W. B. D.

#### SECTION N—MEDICAL SCIENCES, SUBSECTION N—PHARMACY OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

BY JOHN C. KRANTZ, JR. *Chairman*

Section N<sub>2</sub> held a session on Monday afternoon December 30th, at which nine papers were presented by the respective authors and one was read by title. Also a joint session was held with Section N at which three papers were read.

Dr. George Reddish, of the St. Louis College of Pharmacy, discussed the potentialities and limitations of the phenol coefficient test. He stated that the test was applicable only to the study of the germicidal properties of compounds of a phenol like nature. Also Dr. Reddish pointed out that many of the discrepancies that are reported by various workers with this test are due largely to deviations from the standard technique. The use of the test in evaluating antiseptic solutions was questioned.

Dr. John H. Gardner of Washington University discussed the chemistry of aloin. His researches indicated that there was possibly no anthracene nucleus in aloin and furthermore that the definition of the United States Pharmacopœia defining this substance was not correct.

Dr. Noel E. Foss of the School of Pharmacy of Duquesne University, prepared a large number of new unsymmetrical aryl sulphides. He reported on their structures, bacteriological activity and pharmacology. The thymol derivative was found to be the most germicidal.

From the School of Medicine of the University of Maryland John C. Krantz, Jr., and his associates reported on the pharmacology of trichlorethylene and studies that were made with it as a useful therapeutic agent in the treatment of *angina pectoris*. The effect of the various chlorinated ethylenes on the blood vessels of the frog was studied also.

# EDITORIAL

E G EBLERLE, EDITOR

2215 Constitution Ave., WASHINGTON D C

## PHARMACY AND PUBLIC HEALTH

THE completion of the U S Pharmacopœia and of the National Formulary draws attention to the importance of pharmacy in the work of revision and in improving the Materia Medica required by physicians and others who use these agents in their practice Surgeon General Hugh S Cumming closed an address at the Portland, Maine, meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1928, by saying that "in the field of public health education and the support of and cooperation with the official health agencies, the pharmacists of this country have their opportunity and responsibility in contributing toward the efficacy of applied public health science "

Coming down the years are outstanding contributions by pharmacists that have aided the physicians in conquering disease, giving relief, and supplying the means for the prevention of disease Every epidemic and the afflictions that handicap those who have recovered from acute attacks of disease awaken research workers to their duties and opportunities among whom are many pharmacists

The approach of the President's birthday celebration brings to attention the disease which has baffled search for a cure without physical handicap Infantile paralysis attacks not only the young but those more advanced in years and presents a problem yet unsolved, while this is true, more are giving study and more are hopeful that some one will find the means of relief There is a source of satisfaction in the responses for help affording the means of treatment This outstanding effort is growing and there are other institutions, notably the Crippled Childrens' Hospitals, which have brought relief to thousands of unfortunates

During the past year meningitis has appeared as an epidemic and also other ailments that more frequently afflict, in all of these the pharmacist has a part, but usually as a citizen, however, whenever the call comes for service, he responds

The service rendered by laboratories, as an example, "the Banting Foundation, quoting the *New York Times*, has been able to aid ninety-two projects in Canadian universities and to finance the work done at the University of Toronto on silicosis and vitamins " The *Times* comments "If this (acceptance of endowments) is wicked the universities should be consistent and reject all endowments for medical research For endowments come from profits—sometimes profits from the sale of patented drugs and medical apparatus "

Discovery of a new compound of insulin, protamine insulin, has been heralded as most important in the treatment of diabetes—a disease claiming millions of victims

The reports made in the press of the Association for the Advancement of Science meeting and of the studies presented before the AMERICAN PHARMACEUTICAL ASSOCIATION at the Portland meeting, some of which have been published in the JOURNAL, speak of the importance of pharmacy in public health Writing somewhat along the same lines as these (June 1928) it was stated The aim of the professions is to serve and pharmacy will adapt itself to the changing conditions, and "to serve well" marks the character of pharmacy, in that service a cooperation of all the activities is most essential Pharmacy must change with therapeutic and, to some extent,

with surgical practice, the faculties of the pharmacy schools, therefore must, as never before, keep in touch with the advances and changes going on Pharmacy has always supplied the knowledge concerning drugs and preparations required in medical and related practices and it will move on with the new orientation of therapeutics but mindful that desire and over-enthusiasm are sometimes a hindrance to progress Correspondingly, in the education of the young pharmacist the older curriculum cannot be set aside, it is an essential part of the new, associated with the curriculum entailing knowledge and training which develop an understanding of the lines of evolution in the production of materia medica and of methods by which "their therapeutic value is detected and investigated, before they reach the stage of clinical application"\*

### CONFIDENCE, COORDINATION AND COOPERATION ARE ESSENTIALS FOR SUCCESSFUL LEGISLATION

**I**NSTEAD of means for economic welfare there is too often a practice of economic warfare, resulting in lack of success and progress Pharmacy is well organized, but groups and individuals are not always earnestly and sincerely intent on joining their efforts with others, as a result there is a division instead of coordinated co-operative efforts There is a willingness to let others improve conditions, if they can or will, while others seek what they believe for their own interests Realization seems to be developing, and should—that success depends on unison in action as far as this is reasonably possible and that confidence within the groups is essential, strengthened by a right understanding within related activities

Legislation is necessary, but is not the sole essential—a proper understanding and due regard for the rights of all is quite as necessary, it is a stimulus and a corrective, promoting friendship and better service

Laws should be the expressed demands of the people as a result of interest and study of existing conditions, which should be corrected for the general good, it is not promoted by the outstanding financial success of a few, especially if selfish motives predominate, it is necessary to look beyond the present and the limitations that obtain toward common interests Citing an example with the latter thought—the proposed "Tydings Enabling Act" provides that nothing in the anti-trust laws shall render illegal, contracts or agreements prescribing minimum prices for the resale at retail of a commodity which bears, or the label or container of which bears the trade-mark, brand or the name of the producer or of the owner of such commodity and which is in fair and open competition with commodities of the same general class produced by others, when contracts or agreements of that description but not related to trade or commerce among the several States or with foreign nations are lawful under any statute now or hereafter in effect in any State, territory or the District of Columbia in which such resale at retail is to be made, and the making of such contracts or agreement shall not be an unfair method of competition under Section 5, as amended and supplemented"<sup>1</sup>

It is hoped that this measure, if enacted, will prove helpful in bettering business conduct and an advancement to a broader and more hopeful situation while laboring for the welfare of the people

\* Dr H H Dale before the Pharmaceutical Society of Great Britain March 13 1928

<sup>1</sup> See August JOURNAL page 731 and Editorials pages 832-833

# SCIENTIFIC SECTION

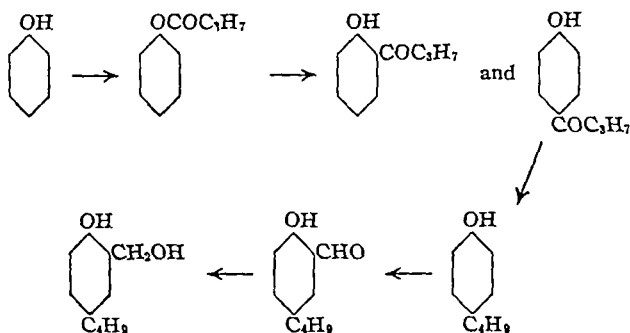
BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, Glenn L Jenkins, John C Krantz, Jr.,  
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Frederick V Lofgren

## THE PREPARATION OF *p*-BUTYL SALIGENIN \*<sup>1</sup>

BY ROBB V RICE<sup>2</sup> AND WILTON C HARDEN

The preparation of this compound was undertaken in order to compare some of its physical and pharmacological properties with other substituted saligenins which have been prepared and studied. A comparison of these properties will be reported elsewhere.

The compounds prepared leading to the final formation of *p*-butyl saligenin are shown according to the following scheme:



The synthesis of *p*-butyl phenol necessary for the preparation of *p*-butyl saligenin was tried by three different methods. (a) The method of Fries was used for the rearrangement of phenyl-acyl esters to acyl phenols with the aid of aluminum chloride and subsequent reduction according to Sandulesco and Girard (1) with amalgamated zinc and hydrochloric acid. This procedure involved the formation of phenyl butyrate and its rearrangement to produce both *o*-butyryl phenol and *p*-butyryl phenol. The *p*-butyryl phenol was then reduced to give *p*-butyl phenol. (b) The method of Read and Mullin (2) was attempted according to which butyl benzene is nitrated, reduced to *o*- and *p*-amino-butyl benzenes, then the amino group replaced by a hydroxyl group by diazotization of the sulphate of the amine and slow elevation of the temperature. This method was discarded due to the fact that yields of butyl benzene obtained by the methods of Read and Foster (3), Radziszewski (4) and Balbino (5) were so low that further experimentation seemed impractical. (c) The method of Smith (6) was tried in which *n*-butylphenyl ether was rearranged by means of aluminum chloride and which gave approximately the same yields as method (a). Method (a) was preferred, however, since the mixture of *o*- and *p*-butyryl phenols obtained by rearrangement was easier to separate completely than a mixture of *o*- and *p*-butyl phenols.

\* Scientific Section A Ph A Portland Ore, 1936

<sup>1</sup> From the laboratories of Glenn L Jenkins Department of Pharmaceutical Chemistry, University of Maryland, School of Pharmacy

<sup>2</sup> Dunning Fellow, University of Maryland, School of Pharmacy



5 *butyl-salicylaldehyde* was made from *p*-butyl phenol by means of the Reimer-Tiemann reaction (7) for the production of aldehydes and this compound was reduced to *p* butyl saligenin by the Adams platinum oxide catalyst reduction method (8)

## EXPERIMENTAL

*Butyl Phenol*—295 Gm of thionyl chloride was added slowly with shaking to 220 Gm of butyric acid. A reflux condenser was then attached to the flask and the contents heated on a water bath until gas evolution ceased. 235 Gm of phenol was next added in small portions with shaking and the flask was again connected to the condenser and heated on an oil bath at 130° for three hours or until no more hydrogen chloride was evolved. The resulting liquid was placed in a beaker surrounded with ice and allowed to cool then 334 Gm of anhydrous aluminum chloride slowly stirred in. This resulted in an amber colored viscous mixture which quickly thinned and produced large amounts of hydrogen chloride on warming. Heating was continued at 130° until no more gas was given off leaving an almost solid red brown mass which was poured onto a flat plate while hot. On cooling a brittle solid resulted which was powdered and dropped into cold dilute hydrochloric acid with stirring. The dark viscous liquid which separated was diluted with benzene separated from the acid and dried with anhydrous sodium sulphate. After distilling off the benzene vacuum distillation of the remaining oil gave three main fractions: (a) a low boiling fraction of undetermined composition, (b) a fraction distilling at 100–110° at 8 mm pressure (*o* butyryl phenol), (c) a fraction distilling at 165–180° at 8 mm which solidifies immediately on cooling (*p* butyryl phenol). An average of 100 Gm each of Fractions b and c was obtained in several trials of this method. The *p* butyryl phenol was purified by recrystallizing from ligroin containing 5 per cent benzene until the melting point was constant at 91° (9).

To reduce this substance 50 Gm was placed in a three necked flask provided with a mechanical stirrer and reflux condenser the flask containing 250 Gm of amalgamated zinc and 250 cc of concentrated hydrochloric acid. The contents were boiled and stirred very vigorously over a period of twenty hours more acid being added from time to time. The *p* butyl phenol produced was diluted with benzene dried with anhydrous sodium sulphate and distilled in vacuum. It distils at 119° at 10 mm pressure. A yield of 70–76 per cent was obtained by this reduction. The product melts at 22° and boils at 248° which is in agreement with data reported by other workers (1). It produces a phenyl urethane melting at 113°. Analysis: Nitrogen found—5.20 per cent, calculated—5.20 per cent.

5 *Butyl Salicylaldehyde*—In a three necked flask provided with a mechanical stirrer, reflux condenser and thermometer 120 Gm of chloroform was added to a mixture of 50 Gm of *p* butyl phenol and 160 Gm of sodium hydroxide in 160 cc of water over a period of three hours. The reaction was carried out at 65–70° by heating in a water bath. The addition of enough water during the reaction to aid in better stirring did not affect the yield of product. It was necessary to stop the addition of chloroform frequently to prevent the mixture from frothing over. Stirring and heating were continued for an hour after all chloroform had been added. The mixture was then subjected to steam distillation to remove excess chloroform and finally acidified carefully with dilute sulphuric acid and again subjected to steam distillation until no more aldehyde was obtained. The average yield was 10 Gm.

The resulting aldehyde which distilled as a pale yellow thick liquid was purified by making the sodium sulphate addition product which can be recrystallized from alcohol.

*Reduction of 5 Butyl salicylaldehyde*—About 300 cc of alcohol and 0.2 Gm of Adams platinum oxide catalyst were added to 10 Gm of aldehyde. The container was then attached to a mechanical shaker and placed under a pressure of ten pounds of hydrogen. Shaking was continued until no further reduction took place. Yields of from 80–90 per cent were obtained by this method.

After reduction the alcoholic solution was made faintly alkaline to litmus with ammonia to prevent polymerization and the alcohol evaporated on a water bath. The *p* butyl saligenin thus obtained may be recrystallized from carbon tetrachloride. It crystallizes as white plate like crystals soapy to the touch. M p 81°. The compound is practically insoluble in water but readily soluble in alcohol, carbon tetrachloride, benzene, chloroform and acetone.

The author wishes to thank Dr Fitzgerald Dunning, of Hynson Westcott and Dunning, Inc, for the use of their laboratories and material while carrying out this investigation

#### SUMMARY

*p*-Butyl saligenin has been prepared from *p*-butyl phenol by the formation of 5-butyl salicylaldehyde and its subsequent reduction with hydrogen

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#### BISMUTH-SODIUM-POTASSIUM TARTRATE SOLUTIONS \*

BY A H CLARK <sup>1</sup>

Considerable interest has been taken during recent years in the so-called complex bismuth tartrates. The soluble salts have been used extensively in the treatment of syphilis in place of arsenic compounds, and solutions have been used for local applications. This communication deals with the preparation of a neutral solution containing bismuth in combination with tartrate and glycerin.

After many experiments or trials it has been established that such solutions are readily obtained by the procedure outlined.

Bismuth hydroxide is first prepared as free as possible from bismuth salts by dissolving bismuth subnitrate or subcarbonate in water and nitric acid. This solution is then precipitated with ammonia water and washed by decantation and collected by aid of a Büchner filter and moisture removed as completely as possible by suction.

The moist precipitate is then added to glycerin and a solution of Rochelle salt. To this mixture is then added sodium or potassium hydroxide until solution takes place.

To the strongly alkaline solution thus obtained is added tartaric acid until the mixture is neutral to litmus paper.

By this procedure a solution is obtained that is neutral or faintly acid to litmus or phenolphthalein and shows slight alkalinity to methyl orange. It will also contain a small amount of nitrate. Just what is the state of combination between the tartrate, bismuth and glycerin it is impossible to state as the writer has prepared a large number of solutions in which the proportions of the three vary widely. It is possible to vary the proportions of bismuth, glycerin, alkali and tartrate within wide limits. Indeed it is possible to prepare solutions from bismuth hydroxide, glycerin and alkali alone but such solutions are strongly alkaline in reaction. By starting with a stated amount of bismuth salt yielding a known per cent of  $\text{Bi}_2\text{O}_3$  upon ignition, a solution containing a desired per cent of  $\text{Bi}_2\text{O}_3$  may be

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\* Scientific Section A PH A, Portland meeting, 1935

<sup>1</sup> University of Illinois, College of Pharmacy, Chicago

readily obtained A typical procedure is as follows, the quantities given yielding a solution containing about 12 Gm  $\text{Bi}_2\text{O}_3$  in 100 cc

Bismuth Subcarbonate	15 Gm
Water	25 cc
Conc nitric acid	25 cc

Heat but do not boil until solution is complete and all carbon dioxide is expelled Dilute to about 600 cc but not to the precipitation point Add ammonia water in slight excess Use litmus paper and have the mixture alkaline throughout Collect the precipitate on a Buchner filter by suction washing well to remove soluble salts

Dissolve 10 Gm Rochelle salt in water to make about 25 cc When the Rochelle salt is dissolved add 20 cc of glycerin and heat to about  $100^\circ\text{C}$  Do not boil

To the hot mixture add the bismuth precipitate and mix well To this mixture add a 50% solution of sodium hydroxide, a few drops at a time, stirring continuously until solution is complete to this solution add a pasty mixture of tartaric acid and water, a little at a time, until it just turns blue litmus red No precipitation should occur at this point, but if it does—a drop or two of ammonia will usually clear up the precipitate Add water to bring the volume up to 100 cc

The above has been varied by increasing or decreasing the glycerin, substituting sodium tartrate or potassium tartrate for the Rochelle salt, potassium hydroxide for the sodium hydroxide, etc It has been found that within a quite liberal range all these factors may be varied and solutions obtained that seem to be permanent

Experiments are under way to determine whether or not a solid bismuth compound that is permanent and soluble in water can be separated from such solutions

## DRUG EXTRACTION VI DETERMINATION OF THE PRESSURE EXERTED BY A DRUG DURING PERCOLATION \*<sup>1</sup>

BY WILLIAM J HUSA<sup>2</sup> AND LOUIS MAGID

Previous experiments (1) seem to indicate that maximum swelling of powdered drugs is not attained with the proportions of liquid ordinarily used in moistening drug powders preparatory to packing in a percolator From this it would follow that a certain amount of pressure would be developed in the percolator after the drug has been packed and excess menstruum added This pressure might affect the imbibition of the menstruum, the solvent power of the menstruum, or result in a slowing or even complete stopping of the process of percolation Because of the fundamental importance of this question, an apparatus and a method have been developed for the determination of the pressure exerted by a drug during percolation Using this new apparatus, measurements have been made on powdered belladonna root, rhubarb, senna and red cinchona

### APPARATUS FOR DETERMINATION OF PRESSURE

An apparatus (Fig 1) has been developed whereby the pressure exerted by a powdered drug during percolation can be measured A rubber tube closed at one end and connected to

\* Scientific Section A PH A Portland meeting 1935

<sup>1</sup> This investigation was aided by a grant from the AMERICAN PHARMACEUTICAL ASSOCIATION Research Fund

<sup>2</sup> Head Professor of Pharmacy University of Florida

a glass tube at the other end, is placed in a percolator in such a manner that the powdered drug may be packed entirely around it. The rubber tube is filled with water as is also the connecting glass tube down to a point exactly opposite the bottom of the rubber tube. Mercury then fills the remainder of the glass tube bent in the form of a U, until the mercury in the two arms is at the same level. The powdered drug is packed firmly around the rubber tube, using moderate pressure, and taking care not to displace the levels of the mercury arms. As the percolation proceeds, the volume of the rubber tube is kept constant by maintaining the level of the left mercury arm. As more menstruum is added, any pressure caused by further swelling of the drug tends to force the mercury in the left arm downward but this force is neutralized by the addition of mercury to the right arm by means of an extension filled with mercury and connected to the bottom of the U-tube. By measuring the height of mercury in the right arm from the point designated as zero, the increase or decrease in pressure exerted by the drug can be determined. The volume of the drug in the percolator is kept constant by means of a perforated brass plate, which is placed on the surface of the powdered drug and kept in place by means of rods clamped in a fixed position.

The authors are indebted to Dr. R. C. Williamson, Head of the Department of Physics, for helpful suggestions in connection with the development of the apparatus.

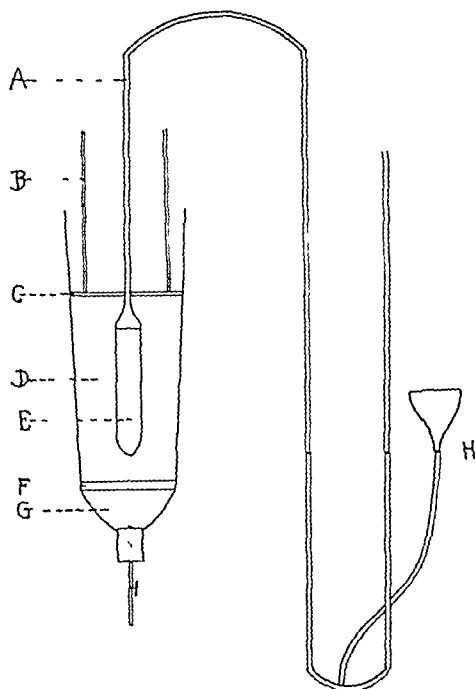


Fig 1—Apparatus for determination of pressure in percolator. A—Glass Tube, B—Iron Rod, C—Perforated Brass Plate, D—Drug, E—Rubber Tube, F—Sand, G—Cotton, H—Level of Mercury

#### EXPERIMENTAL DATA

*Pressure in Percolator, Rate of Free Flow and Percentage Swelling of Powdered Belladonna Root Moistened with Varying Proportions of Water*—Four 100 Gm portions of powdered belladonna root (moisture content of 9.60%) were moistened with 0, 25, 50 and 100 cc, respectively, of water. No time was allowed for maceration of the moistened powders, each portion being packed in a percolator fitted with the apparatus for determination of pressure, and percolation started within fifteen minutes after moistening using water as the menstruum.

The percolators used being graduated it was possible to ascertain the volume of the packed drugs by correcting the apparent volume for the volume occupied by the apparatus for pressure determination. Data were thus obtained as to the swelling of belladonna root in No. 40 powder when moistened with varying quantities of water.

TABLE I—SWELLING OF BELLADONNA ROOT IN NO. 40 POWDER WITH VARIOUS AMOUNTS OF MOISTENING LIQUID

Cc. of Water Used for Moistening	Volume of Powder	Percentage Swelling
Dry	188 cc	
25 cc	211 cc	
50 cc	225 cc	12
100 cc	245 cc	20
		30

The results in Table I indicate that the percentage swelling increases as the proportion of moistening liquid is increased

The lower orifice of the percolator was left open so that the volume of percolate collected after various time intervals gives a measure of the rate of free flow. In Table II, data are given as to the rate of flow and pressure exerted in the four percolators

TABLE II —PRESSURE DEVELOPED AND RATE OF FREE FLOW FOR BELLADONNA ROOT MOISTENED WITH VARYING QUANTITIES OF LIQUID, USING WATER AS THE MENSTRUUM

Time in Hours	Pressure in Mm of Mercury				Number of Cc of Percolate Collected			
	0 *	25 *	50 *	100 *	0 *	25 *	50 *	100 *
1	64	9	13	10	0	0	0	25
7	69	19	26	19	0	0	15	205
10	69	30	29	17	0	10	40	300
14	69	34	34	15	0	31	92	425
24	69	42	31	11	0	84	200	665
38	99	60	29	7	5	151	328	765
48	108	59	29	6	18	167	360	796
72	123	46	21	4	34	192	420	813
96	119	39		1	49	219		835
120	83	35			53	239		
144	77	29			57	254		

\* Number of cc of moistening liquid used for 100 Gm of drug

The results in Table II indicate that as the proportion of water used for moistening increases, the pressure exerted decreases. In each percolator the pressure rises to a maximum and then decreases. The rate of free flow increases rapidly with increasing amounts of moistening liquid. The menstruum had penetrated completely down through the column of packed drug after 26 hours when the powder was packed dry, after 7 hours when the powder was moistened with 25 cc of water before packing, after 3 hours when 50 cc of moistening liquid was used and in 25 minutes when 100 cc of moistening liquid was used.

The decrease in pressure during the later stages of percolation is probably due to the extraction of soluble constituents, thus decreasing the quantity of solid material present. In the case of belladonna root, the decrease in pressure does not bring about an increased rate of flow, but conversely there is a decreased rate of free flow in the later stages, which occurs later than the decrease in pressure. Apparently some factor comes into play to reduce the rate of flow, possibly this is due to swelling of starch grains or other material in such a manner as to decrease the permeability of the cells, the swelling perhaps taking place in such a way as to fill the open spaces in the drug without increasing the total volume (and pressure).

*Pressure in Percolator Rate of Free Flow and Percentage Swelling of Drugs in Hydro Alcoholic Menstrua*—Data from experiments on various drugs and menstrua are given in Table III

*Time Factor in Imbibition*—An experiment was performed, using the centrifuge method, to determine the amount of imbibition of water by belladonna root in No. 40 powder with 10 minutes, 24 hours and 48 hours of maceration. The pur-

pose of the experiment was to discover whether appreciable additional imbibition took place between 24 and 48 hours, since data on this point had not previously been obtained. The results of the experiments are given in Table IV.

TABLE III—A DETERMINATION OF PRESSURE IN PERCOLATOR AND RATE OF FREE FLOW USING 100 GM PORTIONS OF BELLADONNA ROOT IN No. 40 POWDER

Menstruum Water	Cc of Moistening Liquid 50	% Swelling 36	Hours Before Pack- ing 6	Maceration After Pack- ing 0	Hours for Flow to Com- mence 2 08	Time of Readings in Hours after Flow Started	Cc Per- colate	Pressure in Mm Mercury
						0 50	15	+ 2
						2 33	190	+ 2
						12 33	480	- 4
						17 75	780	- 8
						21 66	1000	- 9
						0 00	0	+13
Water	50	36	6	48	2 25	4 33	50	+17
						15 41	140	+14
						52 00	300	+ 8
						72 75	330	- 2
Alc 5 vol— water 1 vol	0		0	0	1 50	1 58	30	+ 7
						2 75	50	+ 1
						5 58	140	0
						16 83	450	+18
						30 83	950	+15
						46 00	1430	+12
Alc 5 vol— water 1 vol	25	24	0	0	0 41	0 25	30	- 2
						1 92	330	- 4
						4 00	700	0
						4 58	800	+ 2
						5 58	1000	+ 5
Alc 5 vol— water 1 vol	50	24	0	0	0 16	0 25	50	- 2
						1 41	350	- 3
						1 75	480	- 3
						2 75	780	- 2
						3 50	1000	- 2
Alc 5 vol— water 1 vol	50	27	6	0	0 16	0 33	90	- 9
						1 08	350	-10
						1 41	500	-11
						2 33	900	-11
						2 50	1000	-11
Alc 5 vol— water 1 vol	50	24	6	48	0 16	0 08	28	+ 1
						0 25	87	0
						1 25	480	0
						2 83	1000	- 1
Alcohol	0		0	0	0 66	0 25	10	+ 5
						3 66	120	+ 7
						15 58	470	+14
						20 08	600	+18
						40 08	1100	+20
Alcohol	50	21	0	0	0 08	0 20	90	- 5
						0 45	240	- 6
						0 56	420	- 5
						1 11	1000	- 6
B Using 100 Gm Rhubarb in No. 40 Powder								
Alc 4 vol— water 1 vol	50	16	6	48	0 10	0 13	30	+ 1
						0 33	290	0
						0 68	780	- 2
						0 83	1000	- 2
C Using 100 Gm Red Cinchona in No. 40 Powder								
U S P X Menstruum I and II	50	38	6	48	0 20	0 08	28	+19
						0 16	100	+15
						0 35	300	+ 9
						0 86	880	+ 6
						1 00	1000	+ 5

	D	Using 100 Gm	Alexandria Senna in No	20 Powder		
Alc 1 vol —	50	18	6	48	0 10	0 05
water 2 vol					0 10	30
					0 18	50
					0 66	100
					1 68	400
						1000
						+ 1
						0
						- 2
						-10
						-18

TABLE IV —WEIGHT IN GM OF WATER IMBIBED BY BELLADONNA ROOT IN No 40 POWDER

	For 5 Gm of Drug (by Experiment)			For 100 Gm of Drug (Calculated)	
10 Min	Time of Maceration 24 Hrs	48 Hrs	10 Min	Time of Maceration 24 Hrs	48 Hrs
11 74	13 70	14 42	234 8	274 0	288 4
12 02	13 60	14 24	240 4	272 0	284 8
(Av) 11 88	13 65	14 33	237 6	273 0	286 6

The results indicate that imbibition increases somewhat with time

#### DISCUSSION OF RESULTS

*Percolation of Belladonna Root with Water* —Moistening of 100 Gm of powdered belladonna root with 50 cc of water resulted in 20% swelling if no maceration were allowed and 36% if 6 hours' maceration before packing was employed. The swelling results account for the fact that the rate of free flow was greater and the pressure less in the latter case. When 48 hours' maceration after packing is used, the rate of free flow is smaller than when no maceration after packing is allowed. Using 6 hours' maceration before packing and 48 hours' maceration after packing, the pressure in the percolator is greater than when only six hours' maceration before packing is employed but less than when no maceration whatever is used.

*Percolation of Powdered Belladonna Root with Hydro-Alcoholic Menstruum* —Using a menstruum of alcohol 5 vol —water 1 vol, data were obtained on the effects of using varying proportions for moistening, and the effects of the 6-hour period of maceration before packing and the 48-hour period after packing. Allowing no time for maceration, increased amounts of moistening liquid increase the rate of free flow and decrease the pressure. Maceration for 6 hours before packing increased the rate of free flow and decreased the pressure, the pressure in the percolator was increased by maceration for 48 hours after packing. Using a menstruum of alcohol, the rate of free flow is likewise increased and the pressure decreased by use of 50 cc of moistening liquid for 100 Gm of drug.

*Percolation of Other Drugs* —Using the official menstrua and the official processes for the preparation of the respective fluidextracts, percolation experiments were carried out using rhubarb, red cinchona and Alexandria senna. In each case the rates of free flow were very rapid and the pressures exerted decreased during the percolation. The greatest pressure was observed during the percolation of red cinchona, while the greatest decrease in pressure during percolation was observed with senna. The rates of free flow increased during the percolation, showing that as soluble constituents were removed, a more rapid passage of the menstrua was allowed.

#### SUMMARY

An apparatus has been developed for determining the pressure exerted by a drug during percolation. Using this new apparatus, measurements have been made on belladonna root, rhubarb, senna and red cinchona.

In case of belladonna root the rate of free flow decreases after a time, even though the pressure in the percolator decreases, with the other drugs there is a decreased pressure accompanied by an increased rate of flow as percolation proceeds. In general, the use of increasing quantities of moistening liquid decreases the pressure and increases the rate of free flow. Maceration after packing increases the pressure in the percolator. The greatest pressure was observed during the percolation of red cinchona, while the greatest decrease in pressure during percolation was observed with senna.

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A STUDY OF *LACINARIA* SPECIES \*

BY B V CHRISTENSEN<sup>1</sup> AND G M HOCKING

*Lacinaria* or *Lacimaria*<sup>2</sup> is the name generally used to-day by taxonomists for the genus formerly known as *Liatris*, although this latter name still persists on continental Europe. Under the name "Liatris," the corm of several species of the genus has been used in American medical practice for over a century, particularly by the Eclectics and Shakers.

In the present work, attention was confined chiefly to the species *L. spicata* (L.) Kuntze and *L. tenuifolia* (Nuttall) Kuntze, which grow commonly in the region of Gainesville, Florida. The former species was particularly valuable for study because it is the subterranean parts of this member of the genus which have been used most frequently as a drug.

## LACINARIA SPICATA

*Lacinaria spicata* has been known by at least thirty-five common English names of which the most important are (Blue) Blazing Star, (Ohio) Devil's Bite, Rattlesnake's Master, (Spike) Gayfeather, and (Spiked) Button Snakeroot. Some of these names indicate medicinal uses of the plant, and even the scientific name, *Liatris*, is said by some to be derived from a Greek word meaning "invulnerable," referring perhaps to its supposed value in treating (snake) wounds. The species differs from all but two or three others of the same genus in preferring a thinly wooded moist humid soil. It is said to grow throughout eastern North America in the area bounded by the Atlantic Ocean on the east, the Gulf of Mexico in the south, Arizona and Colorado in the west, and Minnesota and Ontario on the north. It is perhaps the most widely distributed *Lacinaria* species.

The underground portions used constitute the corm with attached fibrous roots. The corm is irregularly globoid, tapering to the stem above, often laterally lobed, and measuring 1.5 to 2.5 cm. in vertical diameter and 1.5 to 3 cm. in horizontal diameter. Externally, it is pale reddish brown to brownish gray, with roughly furrowed surface, the upper portion covered with adherent fibrous leaf bases. The lower bearing numerous small fibrous roots which originate largely at the tips of the corm protrusions. Fracture tough, woody, showing dirty yellowish internally, when cut, showing wavy sheen. In younger specimens one or two, in older several, woody rings

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<sup>2</sup> The authors consider *Lacimaria* to be somewhat less preferable than *Lacinaria* because the same name is given to a molluscan genus.



noted as distinct striations. The corm is protected externally with several layers of cork cells while the great bulk of the organ consists of parenchyma tissue. Scattered sporadically through the cork and constituting a secondary cortex to protect the vascular bundles outside of which they lie are strands of sclerenchyma. Sclerenchymatic strands also extend radially through the phloem and xylem.

Odor strongly terebinthinate, aromatic, somewhat resembling that of elecampane. Taste strongly terebinthinate, acid, unpleasant, burning.

The roots are small and fibrous. In cross section the cortex is approximately equal in thickness to the wood from which it is easily separable.

#### LACINARIA TENUIFOLIA

This species has been referred to in English by at least thirteen common names, of which the most characteristic is probably Slender-Leaved Blazing Star, or simply Blazing Star. In the region of Gainesville, it appears to have the common name of "Deer Bowl."

The plant has a more restricted geographical distribution than *L. spicata*, being found from North Carolina to southern Florida and west into Alabama.

The corm is sub globose in older specimens tending to become irregular in form, varying from 1.2 to 2 cm. in vertical diameter and from 1.5 to 3 cm. in horizontal diameter. Externally dark grayish brown with smooth surface, upper portion showing traces of stem or stems, lower portion bearing root scars and fibrous roots much less abundant than in *L. spicata*. Fracture of corm woody, internally pale yellowish to faint brownish white. Otherwise similar to *L. spicata*.

Odor characteristic, aromatic, somewhat terebinthinate, taste rather sweetish and pungent.

#### CHEMISTRY

General analysis by the Dragendorff scheme gave the following results in percentages of the bone-dry weight.

	<i>L. spicata</i>	<i>L. tenuifolia</i>
Moisture (corrected for vol. matter)	7.79	7.61
Ash total	5.32	7.74
acid insoluble		4.38
Petroleum ether extract total	4.18 (hot)	4.58 (cold)
non volatile	4.12	
volatile	0.06	
Ethyl ether <sup>1</sup> extract total	3.46 (hot)	9.81 (hot)
non volatile	2.91	7.86
volatile	0.55	1.95
Ethyl alcohol extract	2.08 (abs.)	6.81 (92%)
		14.69 (70%)
Distilled water and NaOH solution extract	67.74	56.02
Total extractive and moisture	85.25	84.83
Crude fibre, etc.	14.75	15.17
	100.00	100.00

<sup>1</sup> Used ordinary ether (97%).

The specific constituents found included the following: <sup>1</sup> volatile oil 0.02% (0.06% in

<sup>1</sup> Qualitatively the two species were found very similar, unless others are noted, the percentages refer to *L. tenuifolia*.

*L. spicata*), fixed oil, 4.56%, unsaponifiable matter, 0.02% resin acids, 3.59%, resenes, etc., 4.29%, tannin, a sterol caoutchouc like substance, phlobaphene, bitter principle, reducing sugars, including ketohexoses, inulin, phytomelane, suberin, lignin, cellulose, mineral matter

The sclerenchyma cells of the rhizome and also of the pericarps of both species and also of *L. pauciflora* (Pursh) Kuntze were embedded in phytomelane. This material has been found in the flower head of *L. scariosa* by Hanausek (1), and it has been discovered in the flower heads of many other *Compositae*, but this is apparently one of the few times in which it has been reported from the underground parts.

The sterol resembled that one found by Rimpler (2) in the beet and named by him "Betasterin." This sterol had a melting point of 116°, was practically insoluble in cold water, and boiling water dissolved only one part in 1750 of solvent. It was only slightly soluble in 92% alcohol, petroleum ether (1/700), somewhat more soluble in cold absolute alcohol (1/200) and chloroform (1/90), and most soluble in ether (1/24). The sterol occurred in the form of rhombic or acicular crystals. With ferric chloride solution, strong hydrochloric acid, and chloroform, a dark blue coloration was produced. When treated with diluted sulphuric acid (1/5 of water), a greenish coloration was produced, and on the addition of iodine solution, several successive coloration reactions occurred through yellow and red to red-brown.

Coumarin has frequently been reported from the dried leaves of *L. spicata* (3), (4) and related species, while Sanford (5) found that the inflorescence rather than the leaves gave out the greater fragrance. In the present work, dried plants were placed in a chamber saturated with ether vapor. After a time, the plants of both species had the distinct hay odor characteristic of coumarin.

#### USES

Members of genus *Lacnaria* have been used as foods (*L. punctata* Hook by the Tewa Indians (6)), for ornamentation, in perfumery and as insect repellent (*L. spicata*), as medical agents and as adulterants for other crude drugs.

As a drug adulterant, the subterranean parts of *Lacnaria* species have been used to adulterate Helonias (7), and possibly to substitute for *Glycine apios* L. (*Apios tuberosa* Moench), known as Indian Potato (8). *L. spicata* in particular, has been used as a substitute for *Eryngium aquaticum* L. (Water Eryngo Root), while various species of *Lacnaria* have been substituted for the more desirable *L. spicata* (8).

A great deal has been written in regard to the medicinal value and uses of "Liatris." In the past, it has been referred to as alexiteric (especially in rattlesnake bite), diuretic, astringent, tonic, stimulant, alterative, diaphoretic,<sup>1</sup> febrifuge, antispasmodic, anodyne, emmenagogue, expectorant, carminative and antisyphilitic. It has been recommended for use in a great many conditions and diseases, in general, it has been looked upon as most valuable in genito-urinary disorders, in addition to its systemic uses.

To determine as clearly as possible the effects of the drug, preparations of *Lacnaria tenuifolia* were administered first to a guinea pig, in relatively enormous doses, and later to a healthy human subject, in more moderate amounts.

The soft extract prepared by evaporation of the fluidextract was administered orally to a guinea pig weighing 450 Gm. in a dose equivalent to 7.14 Gm. of the crude drug. This represented the equivalent of over 110 Gm. of the crude drug to

<sup>1</sup> Cf. "Diaphoretic or Sweating Powder," patent awarded H. Howard in 1832 (9).

a man weighing 150 pounds By checking urinary output, this was found to remain practically unaffected, although there was a considerable purgative action After the lapse of some time, an amount of the sterol equivalent to 62.4 Gm (of sterol) for a 150-pound organism was administered orally to the same animal no effects were noted

Three experiments were carried on with the human subject, in the first, 28.4 Gm of the drug, in the form of extract and fluidextract, was administered In the second test, 6 cc of the fluidextract, representing the average dose, was administered In the final test, approximately 10 Gm of the crude drug in the form of decoction was given

The effects noted include a local stimulation of the mucous surfaces of the mouth and throat, nausea and revulsion from the extreme bitterness, and slight expectorant action Following absorption, the effects were a pronounced general stimulant and tonic action which manifested itself in insomnia, increased activity, rise in temperature and diaphoresis (the latter two not pronounced, however), and, of particular interest, a reduction in heart rate, with the missing of beats Even a therapeutic dose reduced the pulse from 67 to 53 beats per minute in the course of four hours, while the largest dose given lowered it to 48 beats Contrary to the common opinion, and even to the experimental results of Neal (10), *L tenuifolia* was not found to have a distinct diuretic effect

#### SUMMARY

A pharmacognostic examination of the corm and roots of the species *Lacmearia spicata* (L.) Kuntze and *L tenuifolia* (Nutt.) Kuntze has been made A preliminary chemical examination disclosed the presence of volatile oil, fixed oil, resins, tannin, a sterol similar to Betasterin, and bitter principle, among other constituents Phytomelane was found in both the rhizome and pericarp of the two species and also of *L pauciflora* (Pursh) Kuntze

The drug gives evidence of value as a tonic, stimulant and cardiac drug, but in the doses in which used, it probably is of little value as diuretic or diaphoretic, properties which have generally been ascribed to it

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The University of Texas in coöperation with the Commission of Control for Texas Centennial Celebrations is planning a University Centennial Exposition on the campus at Austin from June 1st to November 30th of this year

THE ASSAY OF HYPOPHOSPHITES OFFICIAL IN THE NATIONAL FORMULARY \*<sup>1</sup>BY GLENN L. JENKINS<sup>1</sup> AND CHARLES F. BRUENING<sup>2</sup>

The ammonium, calcium, iron, manganese, potassium and sodium hypophosphites are official in the National Formulary. The official methods of assay (1) for these salts are based, except in the case of iron hypophosphite, on the argentometric determination of the phosphate formed by the oxidation of the hypophosphite.

The official methods of assays for five of the hypophosphites, in addition to being indirect, are subject to other criticisms regarding accuracy (2), (3).

The results of a prescription survey (4) indicate that the official hypophosphite salts, as well as syrups containing hypophosphites, are extensively prescribed. It is desirable, therefore, because of their wide use and objections to the present official methods, to develop improved methods for the assay of these salts.

## METHODS OF ASSAY

Numerous methods have been proposed for the determination of hypophosphites. These methods may be divided into two main classes, namely (a) Methods based on the determination of the phosphate formed by oxidation of the hypophosphite by acidimetric means or by variations of the molybdate method. These methods have been studied by Viebock and Fuchs (5), Mengdehl (6), Raunich (7), Fiest (8), Ferrey (9), Bond (3) and Barnard and McAbee (10). (b) Methods involving the oxidation of hypophosphite to phosphate and the subsequent determination of the quantity of oxidizing agent consumed in the reaction.

The work of Raquet and Pinte (11), Gall and Ditt (12), Hovorker (13), Wolf and Jung (14), Ionesco-Matiu and A. Popesco (15), Kolthoff (16), Bayer (17), Koszegi (18), Boyce and Bauzil (19), Dickerson and Snyder (2), Ziry (20), National Formulary Bulletin (21), Brukl and Behr (22), Marchott and Steinhauser (23), Rupp and Kroll (24), Harrison (25), Marino and Pellegrini (26) and Cocking and Kettle (27) has showed that these methods of the second class are quite satisfactory. The oxidizing agents used in the above methods include potassium permanganate in alkaline and acid solution, potassium manganate, bromine, iodine, potassium iodate, iodic acid, potassium dichromate and mercuric chloride. The methods in this group appear to be satisfactory and several (21), (23), (24) have been selected for critical study.

## EXPERIMENTAL PART

The samples of the salts used were manufactured by a well known and reputable chemical company. The sodium hypophosphite used was of the chemically pure (C P) grade, the only salt obtainable on the market in this grade. The other five salts were of the National Formulary (NF) grade. All the salts conformed strictly to the tests for purity of the National Formulary. The salts were dried over  $H_2SO_4$  as directed in the National Formulary and these dried salts were used throughout this investigation.

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<sup>2</sup> Abstracted from a thesis submitted to the Graduate School of the University of Maryland by Charles F. Bruening in partial fulfillment of the requirements for the degree of Master of Science.

## NATIONAL FORMULARY METHODS

All of the salts were assayed by the official methods (1) for the purpose of comparison with other methods and to see whether any justification exists for criticism to the methods (2), (3). The official methods of assay of five of the salts are essentially the same differing from each other only in minor details. With the ammonium and manganese salts the positive ions are removed before proceeding with the assay: the ammonium ion being removed as ammonia from an alkaline solution and the manganese ion by precipitation as  $MnO$  by means of hydrogen peroxide in an alkaline solution.

With the exceptions noted the basic method for five of the salts is: The hypophosphite salt is dissolved in water and oxidized by the addition of nitric acid; the solution being evaporated to dryness on the water bath. More concentrated nitric acid is added and the evaporation repeated to obtain complete oxidation. After dissolving the residue in water and making alkaline to phenolphthalein, the phosphate is precipitated in an aliquot by the addition of an excess of  $N/10$   $AgNO_3$ , zinc oxide being used to keep the solution neutral. The reaction is represented by the equation  $3AgNO_3 + NaHPO_4 \rightarrow Ag_3PO_4 + HNO_3 + 2NaNO_3$ . After making up to volume and filtering an aliquot is titrated with  $N/10$   $NH_4CNS$  using ferric alum as indicator. To make the National Formulary methods more precise one modification was adopted: namely the oxidized residue was dissolved in distilled water and made up to a volume of 200 cc. instead of 100 cc. as specified and aliquots of 20 cc. used in place of 10 cc. for the precipitation of the phosphate with standard silver nitrate. The results obtained are shown in Table I.

TABLE I

Hypophosphite salt	Weight of Sample Gm	Amount Found Gm	Yield Per Cent	National Formulary Minimum Requirement Per Cent
Sodium + H O	1 0008	0 9999	99 91	98
	1 0007	1 0013	100 06	
	1 0007	1 0020	100 13	
Potassium	0 9980	0 9687	97 06	98
	0 9982	0 9673	96 90	
	0 9985	0 9659	96 73	
Ammonium	1 0014	0 9606	95 93	98
	1 0013	0 9598	95 86	
	1 0008	0 9584	95 77	
Calcium	0 7503	0 7226	96 31	98
	0 7513	0 7266	96 71	
Manganese + H O	1 0009	0 8947	89 39	97
	1 0009	0 9103	90 95	
	1 0009	0 9029	90 21	
	1 0028	1 0007	99 79	
Ferric	1 0031	1 0025	99 94	98
	1 0008	0 9995	99 87	

The results for the iron salt have been included in this table although the official method of assay depends on a different process than that for the other salts. This method of assay determines the iron content by the usual iodometric method after oxidation of the hypophosphite to phosphate and results are expressed as ferric hypophosphite.

The results obtained for the first five salts indicate that the official methods apparently give low results since only the sodium salt conforms to the minimum requirement of the National Formulary. The results for the manganese salt are very low although similar results were obtained using different samples of the salt.

## NATIONAL FORMULARY METHODS MODIFIED

Silver phosphate: the yellow precipitate formed in the official methods is soluble in dilute mineral acid and low results would necessarily follow if the zinc oxide failed to neutralize all the

acid formed in the reaction, or it may be possible that even though all the acid is neutralized, as shown by neutrality to litmus the solution is not at the optimum  $pH$  to obtain complete precipitation

To investigate the cause of low yields the National Formulary Methods were modified in that sodium acetate was used in the place of zinc oxide with the expectation of higher yields. The official methods of assays beginning with the precipitation were then repeated using aliquots from the same solutions as were used in the assays reported in Table I. The results are shown in Table II with the amounts of sodium acetate used

TABLE II

Hypophosphite Salt	Weight of Sample Gm	Amount Found Gm	Yield Per Cent	Sodium Acetate Used Gm
Sodium + H O	1 0008	1 0317	103 09	0 4
	1 0007	1 0317	103 10	0 4
	1 0007	1 0338	103 31	0 4
Potassium	0 9980	0 9916	99 36	0 4
	0 9982	0 9930	99 48	0 4
	0 9985	0 9930	99 45	0 4
Ammonium	1 0014	0 9878	98 64	0 4
	1 0013	0 9872	98 59	0 4
	1 0008	0 9870	98 62	0 4
Calcium	0 7503	0 7385	98 43	0 4
	0 7503	0 7425	98 96	0 4
	0 7503	0 7419	98 88	1 0
	0 7503	0 7442	99 19	1 0

Although these results do not fully explain the reasons for low yields obtained by the official methods, they are considerably higher and indicate an improvement in the methods. They show however that complete oxidation is obtained by the National Formulary Methods. By this modification, the four salts used in this experiment all conform to the minimum requirement of the National Formulary, and the yield is not affected by the amount of sodium acetate used.

Calculating the sodium salt on the anhydrous basis the results are 85.59, 85.59 and 85.77 per cent. these results indicating that this salt has lost part of its water of hydration.

#### GRAVIMETRIC METHOD

As a method for comparison with the National Formulary and Modified Methods a method used for the determination of hypophosphorous acid given in Treadwell and Hall (28) involving the oxidation to phosphate and determination of the phosphate by precipitating as magnesium ammonium phosphate from a hot solution following the method of B. Schmitz (29), was selected.

Neubauer (30) and Gooch (31) have shown that precipitation in the cold makes it difficult to obtain a pure precipitate of magnesium ammonium phosphate. sometimes the precipitate is contaminated with  $Mg_3(PO_4)_2$  and sometimes with  $Mg(NH_4)_4(PO_4)_2$ . If however the precipitation takes place in a hot solution a very pure, coarsely crystalline precipitate of  $Mg(NH_4)_4PO_4$  is obtained (29). This is ignited to  $Mg P O_7$  and weighed.

Reagents Nitric Acid 36%  $HNO_3$   
Dilute Hydrochloric Acid 10 Gm  $HCl/100$  cc  
Ammonia (Sp. Gr. 0.90)  
Ammonia 1.5 Normal (1 in 10)  
Ammonium Acetate C. P. Crystals  
Magnesia Mixture Dissolve 55 Gm of crystallized  $MgCl_2$  and 105 Gm  $NH_4Cl$  in water adding a little  $HCl$  (3 cc dilute used) and diluting to a volume of 1 liter. For 0.1 Gm  $P O_4$  use 6 cc of solution  
Phenolphthalein Indicator, 1 Gm /100 cc

Procedure A weighed amount of the dried hypophosphite salt equivalent to about 5 millimols is dissolved in 5 cc of distilled water, 5 cc  $HNO_3$  added and the solution evaporated to

dryness on a water-bath. A 5-cc portion of nitric acid is added to the residue and the evaporation to dryness repeated. The residue is dissolved in water, ammonia (sp. gr. 0.9) added until neutral to litmus and the solution finally diluted to 100 cc. Add a few drops of dilute HCl, an excess of magnesia mixture, 5 Gm of ammonium acetate, and a few drops of phenolphthalein indicator. Heat nearly to boiling, run in 1.5N ammonia from a burette while constantly stirring until a turbidity forms. Stir till the precipitate is crystalline and then continue adding the ammonia until a red coloration is obtained. Allow the solution to cool completely, add one fifth of its volume of ammonia (sp. gr. 0.9) and let stand at least four hours. Wash the precipitate three times by decantation with 1.5N ammonia, then transfer to a filter and wash free from chlorides with 1.5N ammonia. Finally moisten the precipitate with a small amount of 1.5N ammonia saturated with ammonium nitrate. Ignite very slowly, gradually increasing the heat until the precipitate is white. A muffle furnace is preferable, finally raising the temperature to 1000° C. and heating to constant weight.

A modified method is used for the calcium salt consisting in the addition of 3 Gm of citric acid previous to precipitation. This modified method is also applicable to ferric hypophosphite.

To check the accuracy of this method the phosphate was determined on two pure samples of sodium phosphate. These samples were manufactured by different companies, sample "A" was Anhydrous Sodium Dibasic Phosphate C.P. and sample "B" the hydrated salt  $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$  Analytical Grade. Sample "B" was recrystallized before using. Both samples were dried at 100° C. as recommended by Murray (32) and carefully assayed starting at the point "add a few drops of diluted HCl" etc. Table III shows the results obtained.

TABLE III

Sample	Weight of Sample Gm	Amount Found Gm	Gm	Deviation	Per Cent
A	0.4466	0.4476	+0.0010		+0.22
B	0.4970	0.4972	+0.0002		+0.04
	0.5275	0.5282	+0.0007		+0.13
	0.5050	0.5059	+0.0009		+0.18

These results are satisfactory and although a trifle high, it is maintained that this method is as accurate as any of the phosphate methods. For this reason this method was used as a standard method of comparison for those salts listed in Table IV. Throughout this investigation an electric muffle was used as results were found to be less accurate with a Fisher Burner, probably due to incomplete conversion of the precipitate.

The results obtained by this method are shown in Table IV.

TABLE IV

Hypophosphite Salt	Weight of Sample Gm	Amount Found Gm	Yield Per Cent
Sodium + H <sub>2</sub> O	0.5004	0.5208	104.08
	0.5003	0.5216	104.26
	0.5003	0.5210	104.14
Potassium	0.4990	0.4984	99.88
	0.4991	0.4983	99.84
	0.4992	0.4988	99.92
Ammonium	0.5007	0.5006	99.98
	0.5006	0.5000	99.88
	0.5004	0.5008	100.08
Calcium	0.5370	0.5370	100.00
	0.5201	0.5203	100.04
	0.5205	0.5199	99.88

Calculating the sodium salt on an anhydrous basis the results are 86.40, 86.56 and 86.46 per cent. A moisture determination on this salt yielded residues representing 86.06 and 86.03 per cent, agreeing with the results on analysis. The small difference may be due to decomposition of the salt at 110° C., the temperature used in drying.

The results show that the method as developed is applicable to the assay of the official hypophosphites. It gives accurate results, the only objection is that it is an indirect method. With the calcium salt it can be applied directly without first precipitating the phosphate as the molybdate compound with the resultant saving of time. By this gravimetric method, more accurate results can be obtained by a double precipitation of the magnesium ammonium phosphate, and this procedure is recommended where large quantities of other salts are present.

#### BISMUTHATE METHOD

In the selection of standard methods for comparison we have adopted the National Formulary Method for ferric hypophosphite. This rapid iodometric method yields excellent results and the iron content has been expressed as ferric hypophosphite.

In the same manner we have adopted the Bismuthate Method as our standard method for comparison for the Manganese salt. The manganese content of the salt was determined by this method as outlined in Treadwell-Hall (28), however, oxidizing the hypophosphite previously with nitric acid. This method yields consistent results as shown in Table V.

TABLE V

Hypophosphite Salt	Weight of Sample Gm	Amount Found Gm	Yield Per Cent
Manganese + H <sub>2</sub> O	1 5017	1 4752	98 24
	1 5017	1 4769	98 35
	1 5017	1 4756	98 26

#### PERMANGANATE METHOD

Hypophosphites are oxidized by KMnO<sub>4</sub> in acid solution to phosphates and this reaction furnishes a basis for two methods as reported by Kolthoff (16) and the method given in the National Formulary Bulletin (21). Because these two methods are similar only the latter was selected for study. The National Formulary Bulletin Method was slightly modified and the following procedure adopted.

Accurately weigh about 0.7 Gm of the salt and dissolve it in enough water to make a final volume of 500 cc. Place an aliquot of 50 cc into a glass stoppered flask, add 50 cc of 0.1N KMnO<sub>4</sub> and 3 cc of concentrated H<sub>2</sub>SO<sub>4</sub>, shake well and allow to stand over night in a dark place. Add 10 cc of KI solution (20 Gm / 100 cc) and titrate the liberated iodine with 0.1N Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> until the solution becomes straw color, then add 1 cc of starch solution (0.5 Gm / 100 cc) and titrate until the solution becomes colorless. Carry out a blank determination at the same time. The difference between the two titrations with 0.1N Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> represents the equivalent amount of 0.1N KMnO<sub>4</sub> used in the oxidation.

The results are found in Table VI and the approximate time of standing is indicated.

TABLE VI

Hypophosphite Salt	Weight of Sample Gm	Amount Found Gm	Yield Per Cent	Time Hours
Ammonium	0 6159	0 6184	100 41	24
	0 6159	0 6188	100 47	24
	0 6159	0 6182	100 37	24
Sodium + H <sub>2</sub> O	0 7893	0 8293	105 07	24
	0 7893	0 8287	104 99	24
	0 7893	0 8285	104 97	24
Potassium	0 7803	0 7757	99 41	12
	0 7803	0 7791	99 85	24
	0 7803	0 7864	100 78	36
	0 7803	0 7862	100 76	36

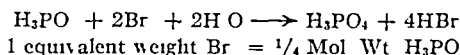
The yield by this method in most cases is in excess of 100 per cent and with the potassium salt the time was varied to note the relation of time to yield. Excessive yields are probably due to side reactions, impurities, etc. although a constant blank was obtained indicating that the oxidizing



agent is stable in the solution used. It is important, however, to add the acid immediately after the permanganate to prevent the complete conversion to  $MnO$  in the neutral solution. If this occurs, complete oxidation is difficult to attain even on long standing. Because of the high results obtained, no further work was done on this method.

#### BROMINE METHOD

Investigations have been made showing that bromine can be used to completely oxidize hypophosphites. This reaction takes place in acid solution as shown by the following equation:



Rupp and Kroll in determining calcium hypophosphite (24) state that the oxidation is made exactly as in the determination of phenol, while Marchott and Steinhauser in assaying hypophosphorous acid (23) used a similar method, but state that the presence of a large excess of mineral acid retards the oxidation.

The method of Rupp and Kroll for calcium hypophosphite was slightly modified and applied to all the salts and the following method adopted to determine hypophosphites:

Reagents: 0.1N Bromide Bromate Solution

(Koppeschaar's Solution) Dissolve 3 Gm.  $KBrO_3$  and 50 Gm.  $KBr$  in water and dilute to 1 liter.

0.1N Sodium Thiosulphate

Potassium Iodide (20 Gm./100 cc.)

Diluted Sulphuric Acid (10 Gm./100 cc.)

Sodium Hydroxide Solution (10 Gm./100 cc.)

Starch Solution (0.5 Gm./100 cc.)

**Procedure:** Accurately weigh about 0.7 Gm. of the salt and dissolve in enough water to make a final volume of 500 cc. Place an aliquot of 50 cc. in a glass stoppered 250 cc. volumetric flask, add 50 cc. of 0.1N bromide bromate solution and 20 cc. of diluted sulphuric acid, stopper, shake well and allow to stand for 2 hours. Add 10 cc. of the potassium iodide solution, shake the flask and titrate the liberated iodine with 0.1N sodium thiosulphate until the solution becomes straw color, then add 2 cc. of the starch solution and titrate until the solution becomes colorless. Carry out a blank determination in the same way. The difference between the two titrations with the 0.1N sodium thiosulphate when multiplied by the appropriate factor gives the amount of hypophosphite salt present.

For iron hypophosphite the above procedure is not applicable due to the insolubility of the salt and to the interference of the ferric ion with the final titration. Therefore, the following procedure was used:

Accurately weigh about 0.15 Gm. of the ferric hypophosphite and transfer to a 200 cc. volumetric flask with a glass stopper. Add 100 cc. of 0.1N bromide bromate solution, 20 cc. of diluted sulphuric acid, stopper and shake well, allow to stand shaking occasionally until the salt is completely dissolved. Standing over night will usually dissolve all the salt. Then add an excess (30 cc.) of sodium hydroxide solution, cool and make to volume. Filter off the precipitate (ferric phosphate and hydroxide) and to an aliquot of 100 cc. add 10 cc. of potassium iodide solution, an excess of diluted sulphuric acid and titrate the liberated iodine with 0.1N sodium thiosulphate.

The results obtained by this method and modification for the iron salt are shown in Table VII. With each of the first five named salts, aliquots from the same solution were used and the results expressed on the basis of amount of salt found in the entire solution.

TABLE VII

Hypophosphite Salt	Weight of Sample Gm.	Amount Found Gm.	Yield Per Cent
Sodium + H <sub>2</sub> O	0.7484	0.7786	104.04
	0.7484	0.7797	104.18
	0.7484	0.7789	104.08

Potassium	0 7282	0 7249	99 55
	0 7282	0 7254	99 62
	0 7282	0 7262	99 73
	0 7282	0 7252	99 59*
Ammonium	0 6670	0 6665	99 79
	0 6670	0 6650	99 70
	0 6670	0 6656	99 79
	0 6225	0 6177	99 23
Calcium	0 6225	0 6181	99 29
	0 6225	0 6181	99 29
	0 6532	0 6421	98 30
	0 6532	0 6421	98 30
Manganese + H <sub>2</sub> O	0 6532	0 6424	98 35
	0 1528	0 1526	99 87
	0 1525	0 1525	100 00
	0 1513	0 1513	100 00
Ferric			

\* Time of standing 6 hours

Calculating the sodium salt on the anhydrous basis the yields are 86.37, 86.49 and 86.41 per cent

This method is simple and rapid and presents no difficulties. The bromide bromate solution keeps very well, no appreciable change being detected after standing six months. It was also found that it is not necessary to run a blank each time as a constant blank was obtained. A factor was obtained by adding 10 cc of the potassium iodide solution to 50 cc of the bromide bromate solution, acidifying with 20 cc of dilute sulphuric acid and titrating with 0.1 N sodium thiosulphate solution. As mentioned above this factor remained constant during the time of investigation of the salts although the sodium thiosulphate was standardized against potassium dichromate at frequent intervals.

#### COMPARISON AND DISCUSSION OF RESULTS

For the purpose of comparison, the average yields from the different methods (Tables I to VII, except III) are listed in Table VIII.

TABLE VIII

Hypophosphite Salt	National Formulary Methods Table I Per Cent	National Formulary Methods Modified Table II Per Cent	Gravi- metric Method Table IV Per Cent	Bismuthate Method Table V Per Cent	Permanganate Method Table VI Per Cent	Bromine Method Table VII Per Cent
Sodium + H <sub>2</sub> O	100.03	103.16	104.17		105.01	104.10
Potassium	96.90	99.43	99.88		100.46	99.63
Ammonium	95.85	98.62	99.98		100.42	99.76
Calcium	96.51	98.87	99.97			99.27
Manganese + H <sub>2</sub> O	90.18			98.28		98.32
Ferric	99.87					99.96

As a basis of comparison for the first four salts we used the Gravimetric Method, for the manganese salt the Bismuthate Method, and for the iron salt the National Formulary Method. It is noted, however, that for the manganese and ferric salts we used the Law of Definite Proportions as a basis for our comparison.

With the acceptance of methods for comparison for all the salts, we are now in a position to discuss the methods of assay individually and find. The National Formulary Methods are unsatisfactory for the following reasons:

1. The methods are indirect ones, determining total phosphates rather than hypophosphites.

2 Although consistent results are obtained by the methods, all the results are low

3 Some difficulty was encountered with the end-point in titrating the excess silver nitrate with 0.1N thiocyanate, a tendency for the end-point to fade being noted

4 No provision is made for the volume occupied by the undissolved zinc oxide

5 Although the actual determination of the phosphate is rapid, considerable time is involved in converting the salts to phosphates

6 The method for ferric hypophosphite is not subject to these criticisms, since excellent results are obtained

The National Formulary Methods, Modified, are an improvement on the National Formulary Methods for the following reasons

1 Higher yields are obtained which approach the theoretical as determined by the Gravimetric Method. These yields indicate that sodium acetate is superior to zinc oxide as a buffer

2 The methods are subject, however, to the criticisms listed in items 1, 3 and 5, under the National Formulary Method

3 These methods may be used to replace the present official methods although the results are only partially satisfactory

The Permanganate Method is considered unsatisfactory for the following reasons: 1 The length of the time of standing is objectionable. 2 High results are obtained in excess of the theoretical indicating side reactions, reactions with impurities, etc. 3 The method is apparently not applicable to all of the official salts

The Bromine Method as developed is very satisfactory for the following reasons: 1 The method is simple and rapid. A complete assay can be run in about two and one-half hours for any of the salts with the exception of the iron salt which requires a longer time. 2 The method is a direct one. 3 The method yields excellent results. For the first four salts listed (Table VIII) close agreement is noted with the Gravimetric Method. With the manganese salt almost identical results are obtained by this method and the Bismuthate Method, and likewise with the iron salt, the results by this method agree remarkably well with those obtained by the National Formulary Method. 4 It can be made applicable to all the official salts. In the case of the iron salt, this method is about as rapid as the National Formulary Method and the results obtained may be of greater value. 5 It is suggested that this method replace the present National Formulary Methods for the official hypophosphites

#### CONCLUSIONS

1 The National Formulary Methods of Assay for Ammonium, Calcium, Potassium, Sodium and Manganese Hypophosphites give unsatisfactory results

2 The National Formulary Method of Assay for Ferric Hypophosphite yields excellent results

3 Modified National Formulary Methods of Assay for Ammonium, Calcium, Potassium and Sodium Hypophosphite give results nearer the theoretical than the National Formulary Methods of Assay

4 The Permanganate Method is unsatisfactory due to its length and excessive yields

5 The Gravimetric Method developed for the assay of the official hypophosphite salt, while not applicable to the manganese salt, is satisfactory The method is simple and accurate

6 The Bromine Method has been developed for assaying the official hypophosphites, and is applicable to all the official salts The method is simple, rapid and accurate

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## EVALUATION OF A DETERIORATION FACTOR IN LIQUID PETROLATUM \*<sup>1</sup>

BY P L BURRIN, A G WORTON AND F E BIBBINS

### INTRODUCTION

The fact that some samples of liquid petrolatum develop peculiar odors when stored under optimum conditions, while other samples stored under the same con-

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<sup>1</sup> From the Control Laboratories, Eli Lilly and Company

ditions do not develop these objectionable odors, led the authors to search for a method of determining this factor. Every one will agree that much progress has been made in producing and purifying mineral oils, and that the oil which is offered on the market to-day is more stable than any oil that could have been purchased a few years ago. Nevertheless, there are oils offered to-day that meet the specifications of the United States Pharmacopœia, which after standing several months on the pharmacist's shelves will display a variety of disagreeable odors and tastes. The pharmacist and pharmaceutical manufacturer indeed have a task in selecting a satisfactory oil by any rapid scientific means, which at the same time will assure a stable product over a period of long aging.

The obvious method of testing samples of liquid petrolatum by storing them at an elevated temperature for a long period of time is satisfactory, but it is time-consuming. It is not practical at all to have to wait many weeks for the results of a test, to determine the advisability of purchasing a certain lot of mineral oil.

There has never been available for pharmacists and chemists a reliable and efficient stability test for liquid petrolatum. The United States Pharmacopœia and British Pharmacopœia since the beginning of the century have required that liquid petrolatum shall not impart more than a pale brown color to a layer of concentrated sulphuric acid after heating for ten minutes at 100° C. with frequent agitation. In this test the depth of color roughly measures the amount of carbonizable substance present. These official volumes have also required that a mixture of the oil, absolute alcohol, and sodium hydroxide solution saturated with lead oxide remain colorless after having been heated at 70° C. for ten minutes. This indicates the absence of sulphur, a common impurity in inferior petroleums from certain geographical sources (1). The British Pharmacopœia has also required that liquid petrolatum when heated on platinum foil be completely volatilized and not give off acid vapors. These tests give only a fair estimate of the quality of an oil, and are not delicate enough to differentiate anything but a grossly impure oil from a high-grade oil.

The American refineries began to refine Pennsylvania, Mid Continent and California oils when the World War cut off the supply of Russian oils (2). The American oils, being saturated hydrocarbons of the methane series, are much more stable than the Russian oils, which are hydrocarbons of the benzene series or naphthenes, and are considered as hydrogenated aromatic hydrocarbons (3). The tests of the United States Pharmacopœia and British Pharmacopœia which seemed adequate for the relatively unstable Russian oils became inadequate for the saturated paraffins of America.

#### DISCUSSION

Schau and Nielsen in a recent paper demonstrate a method whereby the stability of an oil may be measured spectroscopically. They examined eleven samples and found them all to have an ultraviolet absorption band with a maximum at about 2730 Å. and a minimum at about 2500 Å. The amount of absorption, and therefore the height of the absorption band, was found to be proportional to the depth of color developed in the sulphuric acid test. This spectroscopic method has a great advantage over the acid test in that it gives a numerical result instead of a comparative color. Unfortunately, few laboratories have good spectrometers and skilled men to operate them (4).

Arditti reported in 1931 that he measured the stability of paraffin oil containing no sulphur compounds by air oxidation. This was carried out by bubbling air through the hydrocarbon oil at different temperatures and measuring the change in interfacial tension between 0.02*N* sodium hydroxide and the oil to determine the amount of oxidation. No oxidation took place at 15° C, but sixteen hours at 110° C, three hours at 123° C and one-half hour at 150° C showed very marked changes (5).

Green and Schoetzw in 1932 proposed exposing liquid petrolatum in flint-glass bottles to sunlight and ultraviolet light for a relatively short time to measure stability (1).

#### EXPERIMENTAL

Several attempts were made by the authors to devise a test method before a satisfactory one was found. Most of these trials gave vague or inaccurate results.

*Method No. 1*—The first attempt to differentiate high grade from low grade oils consisted of a simple aging test. Nine samples in cork stoppered bottles were placed in a hot room at 45° C to bring about a more rapid polymerization and oxidation than occurs at normal temperatures. At the end of six months when the bottles were opened for a comparison of odors only three of the oils possessed an unmistakably detectable odor. Any further differentiation in the quality of these oils with accuracy was impossible. The results obtained by this method do not justify the time involved in carrying it out.

*Method No. 2*—To bring about a more rapid oxidation and development of odors by which to measure the oxidation, eleven oils were introduced into bottles with tin lined caps, and all were placed in an oven for two weeks at 80° C. When the oils had cooled they were examined for odor. The results of this test are recorded in Table I.

TABLE I

Sample	Odor	Sample	Odor	Sample	Odor
A	None	E	Odor	I	Odor
B	Slight odor	F	Odor	J	Strong odor
C	Odor	G	Odor	K	Strong odor
D	Odor	H	Odor		

That aging at 80° C is superior to aging at 45° C in testing liquid petrolatum may readily be seen. However, this test is far from being satisfactory in that it only distinguishes between the very good oils and the very poor ones.

*Method No. 3*—L. Sonneborn and Sons, Inc., recently submitted to the authors an accelerated method for determining resistance of liquid petrolatums to heat and light. The method consists of subjecting the oil to twenty pounds steam pressure for one hour, allowing it to cool, and finally examining it for objectionable odor. Eleven oils were subjected to this test, the results of which are given in Table II.

TABLE II

Sample	Odor Steam Pressure Method	Sample	Odor Steam Pressure Method	Sample	Odor Steam Pressure Method
A	None	H	Slight	F	Strong
C	None or very, very slight	J	Slight	I	Strong
B	Very very slight	E	Odor	K	Strong
D	Very slight	G	Odor		

Comparing Table I with Table II reveals that generally the effects of dry heat and that of steam on liquid petrolatums are parallel.

This method has the advantage of rapidity of performance, however, like many odor tests it is not entirely dependable because of the personal element involved

*Method No 4*—The Standard Oil Co of Indiana submitted a method for measuring colorimetrically, the quantity of peroxides developed after heating the oil for forty hours in a steam-bath at 211° F. The colorimetric reagent consists of an aqueous and acetone solution of ferrous sulphate, ammonium sulphocyanate and sulphuric acid. The color is developed when the reagent is shaken with the oil, the peroxides of which convert a portion of the ferrous ions to ferric ions which combine with the sulphocyanate ions to produce a dark red color. Three samples B, I and J were heated at 211° F in a steam bath in flasks with long side arms to admit air for the oxidation. Sample I colored the reagent dark red after heating for twelve hours, while B and J gave no color reaction after heating seventy-three hours. Sample B was known to possess greater stability than J although the test did not signify it after seventy three hours' heating. The authors found this method to be impractical because of the great amount of time required to carry it out.

*Method No 5*—Obviously a quicker and more accurate method to determine the stability of liquid petrolatums was desirable. The authors conceived the idea of measuring the peroxides which are readily developed in some of these oils after subjecting them to twenty pounds steam pressure for one hour. The ferrous sulphate and ammonium sulphocyanate reagent of the Peroxide Method was used for this purpose.

Ten oils were subjected to steam pressure, and then examined for peroxides. The results of this procedure together with those of the steam pressure method are given in Table III.

TABLE III

Sample.	A P M I	Odor Index Steam Pressure Method	Sample	A P M I	Odor Index Steam Pressure Method
A	1	1	F	6	7
B	2	2	G	7	9
C	3	3	H	8	6
D	4	4	J	9	8
E	5	5	K	10	10

The results recorded in Table III are interpreted numerically from 1 to 10. The greater the numerical index, in either the A P M I column or the odor column, the greater the amount of peroxides or the stronger the odor in a given sample, *e g*, sample K with an A P M I of 10 and an odor index of 10 contains the greatest amount of peroxides and also possesses the strongest odor of any of the 10 samples. A P M I is the Accelerated Peroxide Method index.

It is significant that the results of the odor tests, using both dry heat and steam, very closely parallel the Accelerated Peroxide Method in measuring the stability of liquid petrolatums. However, it is more significant that oils known from experience to be unstable contain the greatest amounts of peroxides.

## REAGENTS

Solution A is made by dissolving 10 Gm of ferrous sulphate in 500 cc of distilled water to which has been added 10 cc of concentrated sulphuric acid and 1 Gm of potassium sulphocyanate. (Use glassware cleaned with chromic acid and be certain to use uneffloresced crystals of ferrous sulphate and sulphocyanate.) After the ferrous sulphate has dissolved add 1000 cc of commercial acetone. Filter the acetone if taken from a can to insure against contamination with rust. The resulting solution is gently refluxed on a steam bath in the presence of clean iron wire and it is protected from oxygen by introducing a stream of nitrogen or carbon dioxide.

into the top of the refluxing condenser. Be certain the iron wire has no minute rust spots. If doubtful get new wire or rub down the questionable wire with sandpaper. Use a cork covered with heavy tinfoil between the flask and condenser while refluxing. Protect this reagent from air by keeping the containers filled with carbon dioxide or nitrogen. The *colorless solution* is stored in sealed, hard glass bottles containing a piece of clean iron wire. It is well to rinse the bottle with a small amount of the reagent before filling.

Caution should be used in handling the sealed bottles of test solution A, and the testing solution, since considerable pressure develops in storage. It is recommended that stored bottles be not more than one half to two-thirds full.

Solution B is made by dissolving 10 Gm. of potassium sulphocyanate in 500 cc. of distilled water.

The testing solution consists of three volumes of solution A and one volume of solution B. Store in a hard glass bottle containing a small piece of clean iron wire. Here again do not allow the solution to come in contact with the air. This solution is ready to use when it is *colorless* or possesses a slate gray cast. Oftentimes the solution is tinted when first mixed but becomes colorless upon standing for a few hours.

#### TEST METHOD

Add 100 cc. of the oil to be tested to a screw-capped, wide mouth, 8 ounce jar with the entire paper liner removed from the cap. Place the jar in an autoclave after making certain that the screw cap is adjusted very loosely so that steam may enter the bottle. Adjust the steam pressure to twenty pounds, maintaining it for one hour, then remove the sample from the autoclave and allow it to cool. Wipe the moisture from the inside of the cap. Add 10 cc. of the sample to a 10 cc. graduated test-tube, then pipette in 5 cc. of the colorless *testing solution*. (Be certain to replace the air in the test-tube and in the bottle of testing solution with carbon dioxide or nitrogen.) Tightly stopper with a new cork and shake for thirty seconds, then allow the aqueous layer to separate. If the aqueous layer is colorless, the oil contains no peroxides. A pink or red color in the aqueous layer shows the presence of peroxides. A control of 10 cc. of liquid petrolatum and 5 cc. of the colorless testing solution should always be set up.

#### SUMMARY

It may be said that peroxides are formed when deterioration takes place in liquid petrolatum. It may also be said that subjecting liquid petrolatum to twenty pounds pressure under steam for one hour ages it immediately, and develops peroxides that would ultimately be developed upon long aging.

Furthermore, it may be said that following the treatment with steam, an odor from the oil roughly indicates the presence of peroxides and that the ferrous sulphate and sulphocyanate testing solution of the Accelerated Peroxide Method very delicately detects the presence of peroxides.

Finally, oils intended for medicinal purposes, which can be made to develop large amounts of peroxides readily, will develop a disagreeable odor and taste when stored on the pharmacist's shelves. The rapidity of this normal deterioration is indicated roughly by the amount of peroxides formed.

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FLUIDEXTRACT OF ERGOT EFFECT OF ACIDITY ON  
BIOLOGIC ACTIVITY AS DETERMINED BY U S P 1935  
REVISED ASSAY \*

BY F F BERG <sup>1</sup>

INTRODUCTION

Fluidextract of Ergot has been a subject of extensive investigation over a period of many years. Revision Committees of the United States Pharmacopœia have agreed through several revisions upon the advisability of using an acid medium in the extraction of ergot.

In recent years with more effectively controlled methods of physiological assay available, attention has been directed not only to the influence of acid upon the yield of ergot alkaloids but also to its influence upon the stability of these alkaloids. The results of this work are reflected in the use of hydrochloric acid in both the extraction and dilution menstrua in the recent interim revision monograph on Fluidextract of Ergot of the U S P X.

Early in 1930 a series of experiments was undertaken with the object of further determining the possible value of varying the amount of acid used in the extracting medium. A series of fluid extracts was prepared from the same lot of defatted drug. The menstrua contained, respectively, 10, 20, 30, 40 and 50 cc of hydrochloric acid in 1000 cc dilute alcohol.

For purpose of minimizing influences other than acidity the extracts were stored in the dark in small, well-filled, sealed containers. Samples were assayed over a period of approximately three years.

The general indication of the results was to the effect that the greater the acidity of the menstruum and therefore of the resultant extract the greater was the initial and maintained activity of the extract, this apparently confirmed previously expressed opinions and observations as to the influence of acidity on the stability of Fluidextract of Ergot. However, certain unexplained irregularities in the findings and a careful scrutiny of the numerous cocks comb assays of samples which were carried out during this period suggested the possibility that the increased acidity of some of the extracts might in itself be a factor in the observed higher activity of the samples as determined by the cocks comb assay.

With this in mind experiments were carried out for the purpose of determining whether or not the acidity of Fluidextract of Ergot is a factor in the Bio assay value.

EXPERIMENTAL

*Assay Method—Procedure and Method of Calculation*—The tests were carried out on flocks of 35–45 white leghorn cockerels weighing approximately 2 kilos each, an entire flock being used for one day's test. The flock was divided into four equal groups, two of which received doses of the standard sample and two the test samples. The birds in each group all received the same dose, two dose levels being employed for both standard and test sample. The doses, which ranged from 0.1 to

\* Scientific Section A. Ph. A. Portland meeting 1935.

<sup>1</sup> Pharmaceutical Laboratory E. R. Squibb & Sons.

0.2 cc per kilo of bodyweight, were injected into the breast muscle and the effect, expressed as the percentage of the comb area in which darkening occurred, was recorded one, one and one-half and two hours afterward. For purposes of calculation the average of the two highest of these readings was used. Using the group averages, the activity of the test sample relative to the standard was obtained from a dose-effect graph in which the logarithms of the doses were plotted against the effects expressed as percentage of the comb area in which darkening occurred. After an interval of ten days or more the test sample and the standard were again compared, using the same flock of birds but using for the test sample the birds employed for the standard in the first day's test and for the standard the birds previously used for the test sample.

#### PREPARATION OF SAMPLES

In four series of experiments sets of samples of Fluidextract of Ergot and ergotovine ethanesulphonate were prepared by additions of hydrochloric acid, tartaric acid or sodium hydropoxide, as required to obtain specific adjustments of  $p_H$ .

*For Experiment I*—To one volume Fluidextract Ergot B, 188 (made with menstruum containing 40 cc hydrochloric acid per liter) ( $p_H$  3.0) was added

(a) 0.225 volumes of 1 normal NaOH to neutralize one half of the hydrochloric acid used in the extraction— $p_H$  of adjusted fluid extract was 5.0

(b) 0.45 volumes of 1 normal NaOH to neutralize all of the hydrochloric acid used in the extraction— $p_H$  of adjusted fluid extract 6.8

*For Experiment II*—(a) A Fluidextract Ergot (1 cc of extract equivalent to 1 Gm of drug) was prepared by extraction of the ground drug with 45% aqueous solution ethyl alcohol,  $p_H$  of the extract was 5.7

(b) A portion of the 45% alcoholic extract was adjusted to  $p_H$  3.2 by addition of concentrated hydrochloric acid

*For Experiment III*—(a) A Fluidextract Ergot was prepared with 45% solution of ethyl alcohol in exactly the same manner as Experiment II. The  $p_H$  of the extract was 5.7

(b) Concentrated hydrochloric acid was diluted with 40% alcohol to 0.16N

*For Experiment IV*—(a) A solution of ergotovine ethanesulphonate was prepared by dissolving 0.5 mg per cc of the salt in 1% aqueous tartaric acid,  $p_H$  of solution 2.0

(b) A solution of ergotovine ethanesulphonate was prepared by dissolving 0.5 mg per cc of the salt in 0.25% aqueous tartaric acid,  $p_H$  of solution 3.1

(c) An aqueous solution of ergotovine ethanesulphonate was prepared by suspending 0.5 mg per cc of the salt in double distilled water and adding a trace of tartaric acid to clarify the solution,  $p_H$  of solution 5.0

#### RESULTS

The physiological activities of the above-described experiments were determined by the assay method given and the results calculated in terms of activity ratios as follows

*Experiment I*—Fluidextract of Ergot compared to same with acid in extract one half neutralized and acid in extract completely neutralized. Alkali added immediately before injections

Sample	pH of Sample	Dose In jected Cc / Kg	% Average Area Cyanosis for Number Birds Indicated in Parentheses			Relative Activity Calculated from Lot Dose—% Area Effect Correlation Graphs			Weight Av Value Relative Activity			
			First Test	Second Test	Third Test	First Test	Second Test	Third Test				
Fluidext Ergot B												
No 188	3.0	0.13	33	3(10)	30	2(10)	19	2(9)	1.00	1.00	1.00	1.00

Same 0.225 Vol

N—NaOH	5 0	0 13	20 3 (10)	25 5 (9)	19 0 (10)	0 677	0 869	1 00	0 85
Flidext Ergot B		0 9	42 5 (11)			1 00			
No 188	3 0	0 13	33 3 (10)	30 2 (10)	19 2 (9)	1 00	1 00	1 00	1 00
		0 11	43 2 (10)	34 5 (10)		1 00	1 00		
Same 0.45 Vol		0 9	29 6 (7)			0 542			
N—NaOH	6 8	0 13	15 3 (9)	21 2 (10)	19 5 (10)	0 577	0 762	1 00	0 68 <sub>3</sub>
		0 11	19 5 (10)	20 3 (8)		0 500	0 662		(6 tests)

*Experiment II*—Fluideextract of Ergot—prepared with 45% neutral alcohol compared to same with  $p_H$  adjusted to 3.2

Sample	$p_H$ of Sample	Dose Injected	% Av. Area Cyanosis for Number Birds Indicated in Parentheses		Relative Activity Calculated from Lot—% Area Effect Correlation Graphs		Weight Av. Value Relative Activity
			First Test	Second or Crossover Test	First Test	Second Test	
45% alcohol extract ergot, no adjustment	5 7	0.25 cc/Kg	15 7 (10)	27 3 (11)	1 00	1 00	1 00
		0.30	15 5 (11)	38 2 (11)	1 00	1 00	
45% alcohol extract ergot, $p_H$ adjusted by addition concd HCl	3 2	0.25	26 6 (11)	49 2 (9)	1 32	1 44	1 32
		0.30	38 2 (11)	46 8 (11)	1 33	1 117	

*Experiment III*—Fluideextract of Ergot prepared with 45% neutral alcohol compared to same with 0.16N HCl in 40% alcohol injected in opposite breast muscle of test birds

Sample	$p_H$ of Sample	Dose Injected	% Av. Area Cyanosis for Number Birds Indicated in Parentheses		Relative Activity Calculated from Lot—% Area Effect Correlation Graphs		Weight Av. Value Relative Activity
			First Test	Second or Crossover Test	First Test	Second Test	
45% alcohol extract ergot	5 7	0.3	28 0 (11)		1 00		1 00
		0.45	30 3 (9)		1 00		
No adjustment							
“ “ injected in left breast muscle	5 7	0.3	25 8 (9)		1 073		0.93
Dil. HCl—0.16N in 40% alcohol injected in right breast muscle		0.45	38 2 (7)		0 778		
of same birds							

*Experiment IV*—Solution ergotoxine ethanesulphonate 0.5% in double distilled water—trace of tartaric acid to clarify compared to 0.5% ergotoxine ethanesulphonate in 1.0% tartaric acid

Ergotoxine ethanesulphonate 0.5% in double distilled water (trace tartaric acid added to clarify)	5 0	0.08	21 7 (13)	25 0 (13)	1 00	1 00	1 00
		0.12	30 5 (9)	49 7 (12)	1 00	1 00	
Same in 1.0% tartaric acid	2 0	0.08	24 4 (13)	37 6 (13)	1 16	1 23	1 28
		0.12	47 6 (9)	63 2 (9)	1 48	1 25	

*Experiment V*—Same as IV in 1% aqueous tartaric acid compared to 0.5% E. E. S. in 0.25% tartaric

3 1	0 075	23 8 (12)	1 00	1 00
	0 10	33 4 (11)	1 00	
2 0	0 075	21 9 (11)	0 946	
	0 10	31 1 (11)	0 930	0 938

## SUMMARY AND CONCLUSIONS

1 Neutralization in two stages (to  $p_H$  5.0 and to  $p_H$  6.8) of an acid Fluidextract of Ergot ( $p_H$  3.0) at the time of injection resulted in a decrease proportional to the amount of alkali added, of the apparent activity of the sample as determined by the U S P X 1935, Interim Revision Cocks Comb Physiological Test

2 Since adjustment of the  $p_H$  of a clear neutral alcohol extract of ergot from 5.7 to 3.2 by addition of hydrochloric acid resulted in an increase of 32 per cent in the apparent activity of the sample, it is concluded that the apparent decrease in activity which followed neutralization of the acid fluid extract was not related to any effect of the added alkali upon the sample

3 Since simultaneous injection of an amount of hydrochloric acid—equivalent to that present in U S P X Fluidextract of Ergot 1935, Interim Revision into the breast muscles of a series of cockerels opposite to that in which a neutral alcohol Fluidextract of Ergot was injected did not increase the apparent activity of the fluid extract as compared to the activity observed in a second series of cockerels simultaneously injected with the neutral Fluidextract of Ergot alone—it is concluded that the observed influence of the degree of acidity of Fluidextract of Ergot upon the apparently physiological activity of the same is not related to any systemic factor but rather is to be explained in terms of rate of absorption of the ergot alkaloids from the site of injection in the breast muscle

4 Ergotoxine ethanesulphonate solution prepared according to U S P X 1935, Interim Revision to contain 0.5 mg per cc. dissolved in aqueous solution of tartaric acid 1 in 100 ( $p_H$  2.0) showed an apparent physiological activity 28 per cent greater than that of an aqueous solution of ergotoxine ethanesulphonate 0.5 mg per cc  $p_H$  5.0 to which a trace of tartaric acid had been added to clarify the solution. Comparison of the 0.5 mg per cc solution of ergotoxine ethanesulphonate solution in 1 per cent tartaric acid to ergotoxine ethanesulphonate solution 0.5 mg per cc dissolved in aqueous tartaric acid 0.25 in 100 ( $p_H$  3.1) showed the latter to have an apparent activity 6 per cent more than the former. It is concluded that the apparent activity of ergotoxine ethanesulphonate, as determined by the U S P X 1935, Interim Revision Cocks Comb Test, is influenced in the same way by the acidity of the solution in the same manner as is Fluidextract of Ergot but probably to a lesser extent

5 It is concluded from the results presented in this communication that the U S P X Bio-assay value of samples of Fluidextract of Ergot may be materially influenced by the acidity of the solutions which are injected in this assay. This suggests the desirability of including in the U S P XI monograph on Ergot a specification in the assay procedure as to adjustment of ergot solutions for purpose of injection to a stated  $p_H$

The biological assays and tabulations used herein were prepared by the Biological Research Laboratories of E R Squibb & Sons, and I gratefully acknowledge their assistance

## THE STABILIZATION OF MILK OF MAGNESIA BY CITRIC ACID \*

BY E. C. BILLHEIMER AND F. W. NITARDY<sup>1</sup>

An investigation has been made of the stability of milk of magnesia on long aging at elevated temperatures in containers of various types of glass. It has been determined that if milk of magnesia is stored in an ordinary glass bottle at temperatures approximating summer heat, it will develop excessive alkalinity and a bitter, unpleasant taste. The change may be retarded by using a harder, more resistant glass for the container, and can be almost entirely prevented within practical limits by the use of a pyrex glass container. However, because of the excessive cost of pyrex glass bottles for use as market containers for milk of magnesia, it became necessary to investigate other means of stabilizing the product against deterioration, even when packaged in the ordinary glass bottle.

It has been determined that the increase in alkalinity of milk of magnesia when stored under these conditions, and the development of a bitter taste, are due to reaction of the product with the glass bottle. This is shown by the fact that when a non-soluble glass is used, the changes are greatly retarded or entirely prevented. The same result can be accomplished, however, by adding a very small percentage of citric acid to the milk of magnesia, which appears to interfere with the action of the milk of magnesia on glass, possibly because of its buffering action, and greatly extends the period during which milk of magnesia will remain in its original state of alkalinity and taste, even when stored in an ordinary glass bottle. Milk of magnesia to which has been added 0.15% citric acid develops no bitter taste and no increase in alkalinity even after exposure to a temperature of 100° C. for over 250 hours, whereas uncitrated milk of magnesia turns excessively alkaline and quite unpalatable and bitter in 75 hours under the same treatment, 0.1% of citric acid seems to be sufficient for practical purposes.

A standardized testing procedure was developed whereby measurement could be made of the comparative stability of samples of milk of magnesia in glass bottles when exposed at elevated temperatures for long periods of time. This consisted of filling the bottle with the milk of magnesia, attaching a reflux condenser so that no loss of water would occur by evaporation, and immersing the bottle up to the shoulder in a bath at 100° C. Samples of the milk of magnesia were then removed at intervals for tasting and for measurement of change in alkalinity. This testing procedure was found on repeated trials to give quite reproducible results and was used entirely throughout this comparative study. A temperature of 100° C. is, of course, higher than would ever be encountered in the market, but since the deterioration of the milk of magnesia occurs through the reaction between it and the glass, and the speed of the reaction is greatly influenced by temperature, this elevated temperature was chosen to accelerate the rate of change. It produces the same effect which would otherwise occur much more slowly at ordinary temperature.

Tests were made on a large series of compounds, including various organic acids and salts, to determine their value for the stabilization of milk of magnesia.

\* Section on Practical Pharmacy and Dispensing. A. Ph. A. Portland meeting 1935.

<sup>1</sup> Chemical and Pharmaceutical Laboratories. F. R. Squibb & Sons, Brooklyn, N. Y.

Several of them gave some protection, others either had little or no stabilizing effect or were unsatisfactory for other reasons, such as imparting an objectionable taste to the product or otherwise influencing its physical properties. Citric acid in suitable quantity, which of course forms and is present as magnesium citrate, seemed definitely superior to the others, had no appreciable effect in itself on the taste of milk of magnesia, and gave very decided stabilization even at high temperature. Samples of milk of magnesia were prepared which contained 0.5 Gm., 1.0 Gm., 1.5 Gm. and 2.0 Gm., respectively, of citric acid per liter, and exposed to a temperature of 100° C. under the conditions of the test previously described. A control sample of the same milk of magnesia without citric acid was included. It was found that the uncitrated milk of magnesia developed an incipient bitter taste after forty hours' exposure to this temperature, and a pronounced bitterness after 75 hours. The sample containing 0.5 Gm. of citric acid per liter had a slight bitter taste after 94 hours' heating and a pronounced bitterness after 135 hours. The use of 1.0 Gm. citric acid per liter gave somewhat more protection, as incipient bitterness was not observed until 195 hours and pronounced bitterness until 255 hours of heating. However, the presence of 1.5 Gm. of citric acid per liter, as well as 2.0 Gm., apparently stabilizes the milk of magnesia against development of bitter taste. Only a faint trace of bitterness was noticeable after 275 hours, and after 370 hours of heating at 100° C., the product containing 1.5 Gm. per liter was still practically free from bitter taste. The milk of magnesia containing 2.0 Gm. per liter did not develop a trace of bitter taste even after 370 hours of heating. However, since exposure at 100° C. for 250 hours is a more severe test than exposure to summer temperature for a year or more, 1.0 Gm. per liter, or 0.1% citric acid, in milk of magnesia is apparently all that is required for practical purposes to protect the product under conditions encountered in national marketing operations, as no deterioration was observed in extended marketing tests covering several years with milk of magnesia containing even slightly less than 0.1% of citric acid. Measurements on the alkalinity of these samples of milk of magnesia showed also that the citric acid, in addition to preventing the development of bitter taste, greatly retarded increase in alkalinity through reaction with the glass bottle. This method of stabilization of milk of magnesia with citric acid has been offered to, and accepted by the U. S. Pharmacopœia.

#### CONCLUSIONS

1 Milk of magnesia on storage at summer temperature in ordinary glass bottles will undergo deterioration through reaction of the product with the glass. This results in a considerable increase in alkalinity and the development of an unpleasant bitter taste.

2 The increase in alkalinity and development of a bitter taste can be produced in a much shorter time by exposure to a higher temperature, such as 100° C., and a testing procedure has been developed for comparing the stability of variously treated samples of milk of magnesia.

3 The composition of the glass bottle definitely influences the change which occurs in the milk of magnesia on prolonged storage or at high temperatures. The change can be retarded by using a harder, less soluble glass, and practically eliminated by using pyrex glass bottles.

4 The addition of citric acid to milk of magnesia will stabilize it against development of bitter taste and increase in alkalinity in an ordinary glass bottle even on storage at elevated temperatures, 0.1% of citric acid seems to be sufficient for all practical purposes

The assistance given the authors by various workers in the Squibb Research and Control Laboratories is hereby gratefully acknowledged

## WILLIAM WITHERING AND THE INTRODUCTION OF DIGITALIS INTO MEDICAL PRACTICE \*

BY LOUIS H. RODDIS <sup>1</sup>

"The Botanical Professor gives annually a gold medal to such of his pupils as are most industrious in that branch of science. It will hardly have charm enough to banish the disagreeable ideas I have formed of the study of botany." This is the view of the "Gentle Science" held by one, when a medical student at the University of Edinburgh, who was to be one of the greatest of English botanists and, perhaps, the greatest medical botanist.

William Withering, the discoverer of the use of digitalis, was born in Shropshire, England, on March 17, 1741. Shropshire is one of the most beautiful counties of England, and its position adjacent to Wales gives it a record of historical tradition similar to the counties on the Scottish border. The English call the county Salop and its residents Salopians. The highest point in the county, near Withering's birthplace, is a small mountain called the Wrekin, and the local toast

is "To all around the Wrekin." The oaks of Shropshire are so celebrated that that tree is often referred to as the "Shropshire weed." A plant that also grew like a weed around every cottage and along every path was the foxglove (*Digitalis purpurea*).

At Edinburgh, Withering had among his professors such men as Cullen, the author of the celebrated "Practice of Medicine" and the famous anatomist, Alexander Monro, who was distinguished from his equally famous son by the title of Monro *primus*. This son, Monro *secundus*, was succeeded by his son, Monro *tertius*. The professorship in anatomy was held at Edinburgh by these three Monros for over 125 years, an example of a real medical dynasty.

After graduating in 1766, Withering went to the little town of Stafford, where he remained for nearly ten years as a country doctor. His practice here was not so large but that he had plenty of opportunity to study botany and mineralogy.



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\* Section on Historical Pharmacy. A. Ph. A. Portland meeting 1935.

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There is a romantic story relative to his beginning as a botanist. The young lady whom he afterward married was one of his patients. She was an amateur artist, and it was to obtain objects for her pencil and brush that he began to collect flowers and plants of the vicinity. Feminine charms thus overcame the dislike for botany which he had expressed when a student. In 1776 he published the first important English flora written in the English language, the previous descriptions of British plants by Johnson and Ray having been in Latin.

Withering moved to Birmingham about this time, where he became a physician to the newly founded general hospital. He was succeeded at Stafford by Thomas Fowler of Fowler's Solution fame, who was a lifelong friend of Withering. In a few years he established a medical practice said to have been one of the largest, if not the largest outside of London. He still found time for botany and mineralogy, to make meteorological observations, and to publish papers and books on botany and on mineralogical subjects. His distinction as a botanist is remembered by the botanical genus, *Witheringia*, while the mineral Witherite commemorates him as a mineralogist. As if this was not enough to occupy his time, he was also a musician, performing on the harpsichord, flute and the bagpipes. He was also a breeder of cattle, and was one of the first to introduce the Jersey cattle from the Channel islands to the mainland of England. Withering's fame, however, really rests upon his discovery of the use of digitalis in medicine. How his attention was first called to it is best told in his own words:

"In the year 1775 my opinion was asked concerning a family receipt for the cure of the dropsy. I was told that it had long been kept a secret by an old woman in Shropshire who had sometimes made cures after the more regular practitioners had failed. I was informed also that the effects produced were violent vomiting and purging, for the diuretic effects seemed to have been overlooked. The medicine was composed of twenty or more different herbs, but it was not very difficult for one conversant in these subjects to perceive that the active herb could be no other than the Foxglove."

He began to use this remedy in his practice with great success in cases of cardiac dropsy, and in 1785 published "An Account of the Foxglove and Some of Its Medical Uses." Medical men everywhere quickly adopted the use of the drug. It was included in the pharmacopœias of the day, and it has remained in them ever since. Its introduction into use was one of the greatest contributions made by eighteenth century medicine.

Withering used at first a decoction and later an infusion, but finally discarded these for the powdered leaves. He favored the leaves gathered just before blossoming time and removed the midrib. The leaves were then dried in the sun or before a fire. They were then rubbed down "to a beautiful green powder." He gave adults one to three grains of this powder twice a day. He strongly urged against overdosage. Although he regarded digitalis as primarily a diuretic he noted that "it has a power over the motion of the heart to a degree yet unobserved in any other medicine and that this power may be converted to salutary ends." Withering's final conclusions in regard to the uses and effects of digitalis were so sound that our present clinical practice 150 years later (this year is the 150th anniversary of the announcement of Withering's discovery), does not differ materially from his own methods.



If we were to select ten indispensable drugs in the practice of medicine, digitals, would be one of them. We must not forget that Withering gave us this drug and, furthermore, taught us the clinical use of it, for he was really a great clinician, as well as a great investigator.

Withering suffered from tuberculosis, and in 1793 he published an excellent modern treatment for that disease. He died of tuberculosis in 1799. When dying, one of the most celebrated of puns was uttered by a friend, who remarked that "The Flower of Physicians was now withering." He lies buried in Edgbaston Churchyard, and the foxglove appropriately adorns his monument.

## MEDICINE MAKING AS DEPICTED BY MUSEUM DIORAMAS \*

BY CHARLES WHITEBREAD <sup>1</sup>

Museums do what they can to give publicity to collections of interest to special groups by encouraging staff members to prepare papers for presentation at conventions and for publication in association journals. This is done to make the collections of use to those who do not find it convenient to visit the museum.

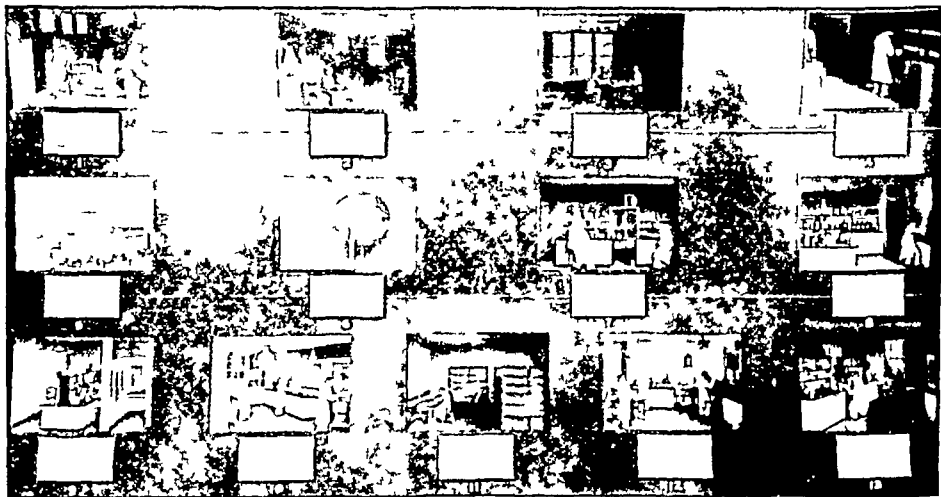


Fig. A—Dioramas of historical and scientific phases of medicine making—*Courtesy of U S National Museum*

The collection of dioramas outlined here illustrates historical and modern phases of medicine making. Pictures of the dioramas are shown, the general labels being lettered and the descriptive legends numbered. These labels and legends were prepared for the laity, but they will be of interest to members of the medical and pharmaceutical professions as well. Reference to the letters and numbers in the following text and illustrations will make it easy to follow the story.

\* Section on Historical Pharmacy. A. Pitt. A. Portland meeting 1935.

<sup>1</sup> Assistant Curator, Division of Medicine, U S National Museum, Washington, D. C.

## A THE MANUFACTURE OF MEDICINES

Up to comparatively recent times medicines consisted largely of salves, infusions, powders and decoctions. All of the preparations were crude and those intended to be taken by mouth, nasty in appearance and vile tasting. There were no standards of uniformity other than a few books of recipes.

With the growth of medical and pharmaceutical knowledge, the ramifications of pharmacy have become so extensive that specialization is imperative. It is no longer practical or possible for one man to undertake, along with the filling of prescriptions and the management of a retail store, the collection of materials from all over the world, and the elaborate processing, assaying, compounding, standardizing, etc. of the great variety of things required by the medical profession. These later phases of pharmacy have been separated from the rest and given over to organizations especially equipped for the purpose—pharmaceutical manufacturers.

The following scenes show how medicine making has progressed, and give glimpses of a typical pharmaceutical manufacturing plant to indicate the hundreds of specialized operators and operations that are required and the careful laboratory testing that is necessary to make the medicines of the present day.

1 A Monastery Apothecary Shop  
(17th century)

In the 17th and 18th centuries apothecaries were shopkeepers who collected medicinal herbs and chemicals and prescribed them for the sick. During the Dark Ages apothecaries were often monks who ministered to the physical as well as the spiritual ailments of their patients.

2 A Pharmaceutical Laboratory  
(19th century)

In the early 19th century pharmacy began to emerge as a science separate from medicine. The apothecary, then called a pharmacist, devoted his time to collecting and compounding medicines while the physician became a specialist in caring for the sick.

3 Doctor and Detail Man

Pharmaceutical manufacturers send trained representatives known as detail men to visit members of the medical profession. These representatives not only furnish information concerning new medicines, but establish personal contacts with physicians thus making it possible to coordinate the findings of the laboratory with clinical needs.

4 A Modern Prescription Pharmacy

Modern pharmacies are conducted for the benefit of physicians and the public at large. The pharmacist of today obtains his medicinal preparations, already prepared and standardized, from pharmaceutical manufacturers. He then compounds and dispenses them in accordance with physicians' prescriptions.

5 Modern Pharmaceutical Manufacturing Plant

Several thousand medicinal substances are in constant use by the medical profession. The manufacturing plants required to make these are of necessity quite extensive. Every effort is made to have working conditions pleasant and healthful in all respects.

6 A World of Raw Materials

The materials from which medicinal substances are derived come from the far corners of the earth. Some are animal, some vegetable and some mineral in origin. Many of the newer drugs are obtained as by products of other industries or are prepared synthetically from other chemicals.

7 Control of Raw Material Purchases

The identification and assay of raw material are of primary importance in controlling the quality of the finished product. The man at the left is studying a botanical drug to insure its exact uniformity to official requirements. The man at the right is engaged in extracting the alkaloid of another specimen to determine its drug potency.

### 8 Chemical Control of Various Stages of Manufacture

This is another control laboratory. In the rear two chemists are analyzing specimens of products taken at various stages of the manufacturing process. In the foreground a finished product is being checked for accuracy of formula and also physical characteristics such as appearance, disintegration, solubility, time, etc.

### 9 Bacteriological Research

Microscopic living organisms produce infectious diseases in man. This scene shows a group of bacteriologists at work. Through study of these organisms and their toxic products in which industrial laboratories participate much progress has been made against these diseases.

### 10 Chemical Research

Here is a view of a chemical laboratory. One of the chemists is altering the structure of a known chemical compound. The discovery of new chemical substances and the synthetic preparation of others known to exist but difficult or expensive to obtain is a field of unlimited possibility for progress.

### 11 Library Facilities

Progressive research work involves the frequent publication of observations as well as the necessity for keeping informed concerning the publications of other laboratories. For this purpose pharmaceutical manufacturers must maintain complete periodical and reference libraries.

### 12 Pharmaceutical Research and Biological Extraction

The study of the action of drugs by determining their effects on animal tissues and functions and the isolation and recovery of physiologically active extracts of animal tissue are two highly important divisions of pharmaceutical research.

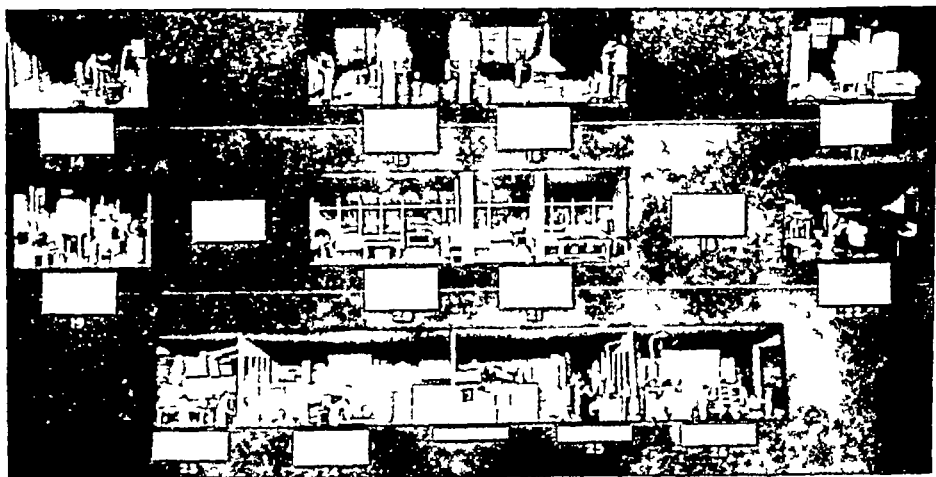


Fig. B — Industrial scenes in a modern pharmaceutical manufacturing establishment — *Courtesy of U. S. National Museum*

### 13 Laboratory of Experimental Pharmacy

The above scene shows a laboratory of experimental pharmacy where manufacturing methods are worked out on a laboratory scale and where such problems as color, taste, appearance and stability are determined for each product before it is given to the plant for actual production.

## B THE MANUFACTURE OF MEDICINES

Extraction of medicinal substances from drug-bearing leaves, barks, beans and roots may be likened in some respects to the ordinary percolation of coffee. The crude material is first ground or milled, then packed into the percolators while it is moist and allowed to macerate or soak for a while before the percolate containing the extractive is drained off.

The fluid percolate is concentrated by evaporation. In some instances "open evaporation," by merely boiling the fluid is practical. Often, however, heat may destroy or alter the properties of the drug so that it is necessary to concentrate by distilling in a vacuum at low temperature. Powdered extracts are obtained by distilling off all the fluid and drying the residue to a solid form. The extracts obtained in this way may then be standardized and incorporated into the form of the desired product.

Scenes 23 to 26 show how granular effervescent salts are made. An effervescent preparation is obtained by putting a dry acid and a dry carbonate into water simultaneously. The carbon dioxide gas which is liberated produces the effervescence as it bubbles through the water. In order to prepare a granular effervescent salt it is necessary to mix the dry powders, moisten them just enough to allow them to cake slightly and then remove the moisture to check the reaction before an appreciable amount of gas has escaped. With automatic controls and with conditioned air, this may be accomplished with such precision that the resulting product is uniform in chemical composition.

## 14 Corner of Milling Room

The balloon-shaped bags over each mill serve to collect and confine the dust from the milling process so that the air is clean and clear at all times. Dust-free air of this kind protects the workers and prevents contamination of the various batches of material being ground.

## 15 Percolation

The ground, moistened drug is packed into small percolators. The fluid or menstruum used varies with different drugs but usually contains alcohol. The percolate contains the extracted drug. This must be sent to the control laboratory to determine the concentration of the active principle.

## 16 Evaporation and Vacuum Distillation

Aqueous extracts are concentrated in steam-jacketed evaporating tanks. Vacuum stills concentrate, at low temperature, percolates containing alcohol or drugs which might deteriorate if subjected to strong heat. The alcohol is recovered and rectified by further distillation.

## 17 Preparation of Elixirs

The mixing of ingredients is accomplished by mechanical stirring devices in glass lined tanks, varying in capacity from 5 to 1000 gallons. Subsequent clarification and filtering is accomplished by mechanically pumping the elixir through a large filter press and back into another tank.

## 18 Pharmaceutical Manufacturers

Many great organizations similar to the one depicted in this series of dioramas have been built up to cooperate with modern pharmacists and to supply them with uniform, dependable and standardized therapeutic agents in keeping with the most recent advances in medical science.

## 19 Emulsification

Some emulsions can be made with a high speed vacuum mixer not unlike a large egg beater, operating in a closed tank. With others, however, particularly where it is necessary to break the dispersed phase into particles of colloidal dimensions, colloid mills are used.

## 20 Ampuls

Sterile solutions are packaged in sealed glass containers called ampuls. After the solution is placed in ampuls with special aseptic technique and sealed it may again be sterilized by immersing the ampuls in hot water or subjecting them to high temperature produced by steam under pressure.

## 21 Sterile Solutions

Solutions of drugs which are to be injected into the tissues or into the blood stream, must be prepared with great exactness to keep them free from contamination with foreign materials. Each solution is passed through a porcelain filter to remove all bacteria without exposing the product to the air.

## 22 Ointments

Ointments are made by stirring the desired medicinal ingredients into the correct mixture of melted greases, fats and waxes. After cooling, a mixture of this kind returns to a semi solid consistency and is then milled with special equipment such as that shown in the center of the room.

## 23 Granular Effervescent Salts

The ingredients of a granular effervescent salt are weighed and mixed in an air conditioned room. Two operators check each weight to guard against error. The mixers are operated a sufficient length of time to obtain a thoroughly uniform mixture. Each mixture is assayed to insure uniformity.

## 24 Granular Effervescent Salts

The dry mixture is spread on trays and subjected to an atmosphere of extreme humidity. This is done in the cabinet at the rear. The moist granules are then screened, placed back on the trays and passed into drying tunnels where the atmosphere is again automatically controlled.

## 25 and 26 Granular Effervescent Salts

The dry granules as they emerge from the tunnel are removed from the trays, again screened and collected in hoppers. The hoppers are used to load the filling machines from which the filled bottles pass on a continuous belt to the capping, labeling and cartoning machines in succession.



Fig. C—A continuation of the industrial scenes, the final dioramas dealing with standardization, finishing, packaging and distributing.—*Courtesy of U. S. National Museum*

## C. THE MANUFACTURE OF MEDICINES

One of the earliest improvements in oral medication was the development of the use of pills as a method of giving medicine in concentrated form. By swallowing a whole pill the patient was able to avoid its bad taste. The earliest type was the so-called mass pill made by moistening powders with a sticky substance and rolling them into pills while they are of a doughy consistency. The invention of a method of coating the pills with sugar was a further refinement in the interest of taste.

The next forward step was the development of the friable pill process in which the pills are made in large revolving tubs by gradually adding the powdered mixture to a previously counted number of starters without the use of a sticky excipient. In this process the pills gradually build themselves up like a snowball by adherence of the moist powder to the starters as the tubs revolve. With a sugar coating this form of pill presents the advantages of the older type plus the additional advantages of friability and greater accuracy of dosage. The next advance was the development and refinement of the process for compressing tablets. It is now possible to punch powders into tablets by machine with an accuracy equal to that obtained in friable pills and at less cost.

The problem of dispensing to retailers is a complicated one. For each product thought must be given to the type of package which is most suitable not only from the standpoint of convenience, cost and appearance, but also with respect to stability after it leaves the plant. Moreover, each package of each manufactured lot must bear its individual lot number. This makes it possible to trace the entire manufacturing history of any single bottle of medicine on the market at any time.

#### 27 Friable Pills

An operator is shown pouring the powders slowly onto the starters in the revolving tubs, moistening the mixture at the same time. When the pills have attained the desired size as measured in the sizer which is shown at the left they are dried in ovens before being coated.

#### 28 Compressed Tablets

Powdered drug mixtures are converted into minute granules by moistening, drying and screening. They are then punched into tablets by rotary compressing machines. The operator checks the weight of the tablets for each machine at 15 minute intervals to be sure that the punches retain their correct adjustment.

#### 29 Coating of Pills and Tablets

Pills or tablets are coated by being rolled in sugar syrup in revolving tubs. Color coatings are applied in the same way. After the coatings are applied a sample of each lot is sent to the Control Laboratory for chemical assay, and for testing disintegration and solubility time.

#### 30 Filling Hard Gelatin Capsules

Special filling equipment designed to fill empty gelatin capsules with an exact weight of powder renders this form of medication available for those who desire it. This type of filling is carried out in conditioned air and the capsules are put into bottles and sealed before leaving the room.

#### 31 Fishing for Cod—Lofoten, Norway

From the livers of cod fish are obtained the growth-promoting vitamin A and the anti-rachitic vitamin D. At certain seasons the fish migrate to the coasts of Norway and Newfoundland. Codfishing is largely confined to these areas and to only a few weeks each year.

#### 32 Extraction of Cod Liver Oil

The finest quality of cod liver oil can be obtained only when the livers are removed from the fish as soon as possible after they are caught, and the oil is extracted at once in vacuum equipment to preserve the vitamin content and prevent the development of rancidity.

#### 33 Removal of Cod Liver Oil Stearin

The stearin is removed from cod liver oil so that the oil will not thicken or solidify when kept in a refrigerator. To do this, the oil is chilled and the solidified stearin removed by pressure filtration. The by product, cod liver stearin, is used in the manufacture of soap.

#### 34 Cod Liver Oil in Steel Drums

The destearinated oil is then graded according to its vitamin potency in preparation for shipment. It is placed in air tight steel drums under carbon dioxide gas to prevent deterioration by contact with air en route and is transported to the United States by steamship.

### 35 Standardization of Cod Liver Oil

On arrival in this country the higher grades of oil are again assayed and standardized on the basis of natural vitamin content. The potency with respect to vitamins A and D is accurately determined by biological standardization using albino rats and checked by chemical methods.

### 36 Filling Bottles

Washed bottles are brought to the filling machines by conveyors. As they are filled carbon dioxide gas is forced into them to displace the air and protect the product. The filled bottles are inspected through magnifying glasses as they pass along the conveyor or belt to the capping machines.

### 37 Finishing Bottles

A moving belt carries the sealed bottles to the labeling machines where a label is put on each bottle after which the bottles are cartoned in single packages and larger lots. The packages are put into shipping containers and conveyed directly to the warehouse to await shipment.

### 38 Distribution

The completed product is shipped to branch warehouses conveniently located at central points in the various sections of the country. From these, wholesalers in the principal cities and retailers in every corner of the country may be served promptly with supplies to fill their needs.

This splendid collection of dioramas was contributed to the Museum by The Upjohn Company, Kalamazoo, Michigan. The subjects to be illustrated were chosen by Dr. E. Gifford Upjohn and those who worked with him. Most of the dioramas are actual scenes of the Upjohn offices and laboratories. The Diorama Corporation of America, Chicago, Illinois, made the dioramas.

Much credit is due The Upjohn Company for its public spiritedness in presenting in such an impressive manner some of the professional and scientific aspects of medicine making—the art of the pharmacist.

This collection of dioramas has been on exhibition since November 1934, and has elicited much favorable comment. It is hoped that members of the association will take the time to inspect this exhibit when they visit the city of Washington.

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## UNDERGRADUATE RESEARCH \*

BY LAWRENCE H. BALDINGER <sup>1</sup>

Undergraduate research, as referred to in this paper, includes that work of an investigative nature, curricular or extra-curricular, assigned to students working for a bachelor's degree. This topic is undoubtedly of more interest to those engaged in the teaching of pharmacy than to those engaged in commercial pursuits. Individuals in the latter group, however, can do much by assisting in this work and by realizing the possibilities of the intelligent application of undergraduate research in developing the scientific and professional attitude of our student pharmacists. Ira Remsen once wrote (1) "There is nothing mysterious about research. Every human being, in fact every animal, is by nature engaged in research, that is to say, trying to find out something about its environment." Research, fundamental or industrial, undergraduate or graduate, is one of the best means of acquiring new information, of developing in the student the qualities of originality, accuracy, reliability, a regard for professional ethics and a respect for hard work and properly directed imagination.

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\* Section on Education and Legislation. Portland meeting 1935.

<sup>1</sup> Department of Pharmacy, University of Notre Dame, Notre Dame, Indiana.

If, by means of well-planned and directed problems in undergraduate research, we can develop to a small degree in our students these qualities so necessary for a professional point of view, the profession of pharmacy will be benefited in so far as these are put to practice

A hasty survey of the catalogs from sixty-three pharmacy schools reveals the following facts. Seven schools state specifically that a thesis in pharmacy or in a related field must be submitted before graduation, and two of these seven give credit to the student for this work, fifteen schools offer research as an elective course in the senior year, the credit given being based upon the amount of work done, two schools offer research but give no credit for the work. In a number of schools instructors assign small problems as part of the regular class work. No mention is made of this work in the catalogs, hence it is difficult to approximate the prevalence of this practice. In many cases, however, the same result is achieved as if the student was assigned a thesis problem which would require the major part of a school year for completion. Research work toward higher degrees is mentioned in catalogs from some of the remaining schools in the list. This data, however, was disregarded because we were concerned only with research offered to or required of undergraduates.

A number of objections have been voiced by pharmaceutical educators toward undergraduate research. While some are unquestionably well founded and worthy of consideration, others can hardly be considered in keeping with good pedagogy and high academic standards. Some say that the curriculum for the four-year course will not permit sufficient time to complete a thesis. Others say that the time spent in writing a thesis could be better utilized by taking extra course work. Cost is considered by some as an obstacle while others confess a lack of subjects for assignment to students. The most frequently voiced objection states that the undergraduate is incapable of doing acceptable research and that the time would be wasted.

The choice of a thesis depends upon the student's likes and dislikes, and upon his qualifications for the work. The latter, obviously, should be considered carefully by the instructor in charge of the research. An important factor, too often overlooked, is the assignment of a problem within the scope of the student's training, a problem which will not be too comprehensive so as to discourage the young researcher. The beginner should be impressed that every new fact, however small or circumscribed, is worth while and that, in the beginning of his career, he should be satisfied with problems dealing with some definite, specific and concrete point, even if it is a small one, and that it is far better to complete a small bit of research than to overtax his limitations on a problem too comprehensive.

Three types of theses may be offered to undergraduate students. The first type is known commonly as a library thesis. In this work the student may trace the history of a law, a preparation or a method of treatment. Obviously, extensive library facilities are necessary for this type of research as well as for the bibliographical thesis in which the student collects bibliographical references for one particular problem without writing a summary of the work which he has done.

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For those students who prefer laboratory work and in those cases where library facilities are limited, a simple problem involving laboratory work as well as

some literature research is most desirable. Here again the director of research must exercise good judgment in selecting and assigning a problem which he knows will culminate with a fair degree of success, a problem which, no matter how small, will give the student a sense of satisfaction in a task well done.

In the two types of theses mentioned thus far a knowledge of scientific literature is not only desirable but imperative. Too many students are being graduated from universities with a hazy idea of what constitutes a good scientific journal, and a still hazier idea of how to go about using a library, either scientific or general. If, in completing a simple thesis, the student does nothing more than to learn how to use *Chemical Abstracts*, the proper method of listing and abbreviating journal references, and to acquire a speaking knowledge of standard reference texts and methods, his work has been well worth while and he has profited by the experience.

The third type of thesis is suggested for those students whose interests are mainly commercial and who expect to enter the business world. A laboratory or library thesis will not appeal to this type of student and it is far better to assign a problem involving survey work in a drug store or one having a commercial interest. In this type of thesis the enthusiastic help and cooperation of the pharmacists in the vicinity of the school are paramount, hence the request, early in this paper, that this group be cognizant of the possibilities of this work. If properly handled, it may result in a closer affiliation between the pharmacists and the school.

As has been stated, the qualifications of the student determine to a great extent the type of thesis assigned, the amount of time to be allotted, and the complexity of the problem. While some juniors are sufficiently mature to begin the work, it seems to be common experience that the first three-quarters of the senior year are best adapted to the work. A student soon learns to budget his time in order to do the maximum amount of work in the shortest time.

To instil into the student the true research spirit, the director must set the example. One can hardly expect the student to show enthusiasm over a problem which is assigned with a glad-that-is-over attitude on the part of the instructor. To familiarize the student with the proper use of the library, the instructor should be thoroughly acquainted with the library facilities in his own institution, neighboring institutions and cities. In this connection it might be well for the reader to review the paper, "The Use of the Library in Undergraduate Instruction" by Lee (2). John C. Merriam (3) has stated four reasons why a university or college includes constructive work as a necessary part of its regular program. Two of the four reasons are as follows:

(a) Investigation is an indispensable means of keeping the faculty in a position to present the most fundamental and most advanced knowledge through its teaching.

(b) Training in creative or constructive work is one of the most important phases of teaching and can be carried out successfully only through actual experience of the student."

It is obvious that research on the part of the instructor is necessary not only for personal intellectual growth but also for assuming the leadership of those under him.

In attempting a brief summary, only a few of the advantages of undergraduate research can be listed. It teaches the student how to use scientific literature and

how to organize material which he has collected from laboratory experiments and from library research, it develops a sense of responsibility, serves as an apprenticeship for those who plan to enter graduate work and, most important of all, it engenders a scientific attitude so necessary in the development of a professional point of view

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- (2) Lee, C O, "Use of the Library in Undergraduate Instruction" Proceedings of the 34th Annual Meeting of the American Association of Colleges of Pharmacy, page 80 (1933)
- (3) Merriam, John C "The Function of Educational Institutions in Development of Research," *The University of California Chronicle*, page 133 (April 1920)

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#### DENTAL PROFESSION MEETS IN NEW YORK

BY GEORGE C SCHICKS \*

Dentistry holds, yearly, at least three conventions of national importance, that of the American Dental Association and the meetings held annually in New York and Chicago

The Greater New York December Meeting of the First and Second District Dental Societies was held in the Hotel Pennsylvania the first week in December. It was the eleventh annual session and was very well attended by dentists and those in allied professions from all parts of the United States, from Canada and South America.

The program for the New York Meeting is always interesting, it was especially so this year.

Dentists have a characteristic way of offering what might be called specialized graduate courses of instruction to their members in the form of clinics. Each clinic is scheduled for three days and two hours each day is devoted to them. The duration of each class is one hour, though some have two hour sessions, therefore six different classes may be met by each lecturer during the three days. Clinicians usually give one lecture to the general assembly during the week in addition to meeting the regular classes. Members of the dental profession may attend the clinics on payment of five dollars. It is surprising and pleasing to note the number of dentists who each year, eagerly await the opportunity to register for such instruction.

The dentists had a wide choice of subjects to choose from in the 23 clinics available. Many of them were of particular interest to the pharmacist as well as to the dentist. Those having more or less specific application to the profession of pharmacy were

- 1 Root Surgery Fundamentals Essential to Success Clinician U G Rickert, Professor of Therapeutics and Materia Medica University of Michigan, and also a member of the Council on Dental Therapeutics

- 2 Surgical Treatment of Pyorrhea, Clinician Theodore O Peterson, Past President Second District Dental Society

- 3 Pre Operative and Post-Operative Treatment Clinician C Raymond Wells, Chief of Dental Service Queens General Hospitals New York

- 4 Root Amputation for the General Practitioner, Clinician E Blumenthal Director Dental Department Greenpoint Hospital Chief of Dental Department Beth Moscs Hospital, Brooklyn New York

- 5 Medication How and What to Prescribe Clinician George C Schicks Assistant Dean and Professor of Materia Medica Rutgers University College of Pharmacy

One morning was given to the combined Medical and Dental discussion of the Report of the Sub Committee on the Study of Curricula of Medical and Dental Schools in the United States and Canada. The Report was presented by M O Magid, M D and discussed alternately

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\* Assistant Dean, Rutgers University, College of Pharmacy

by medical and dental practitioners. The Committee urged a better understanding between the two professions. A list of subjects was mentioned with the suggestion that they be taught in the Medical and Dental Colleges so that each would have a better knowledge of fundamental and special sciences applicable to each profession. In part, the medical men thought that the dentist should receive more instruction in anatomy, pathology, physiology, bacteriology, hygiene and physical diagnosis as it pertains to the practice of the physician. The dentists suggested that the physician should be better trained in maxillofacial surgery, dental infection and its relation to diseases elsewhere in the body, oral diagnosis, etc. It was brought out that out of all the Medical Colleges not more than fourteen made any reference to stomatology in their curricula. Hospital internship is not required of the dentist graduating from College at the present time. The report recommended that the dentist be required to have hospital experience so that he is better equipped to enter the practice of his profession. Dental Colleges have recently had a study made of their curricula by the Carnegie Survey Committee.

One evening was devoted to Topic Discussions. A list of subjects such as Preventive Dentistry, Nutrition and Diet, Operative Dentistry, Porcelain Restorations, and many others were scheduled as "Clinic Sessions without Clinics." Each topic is assigned to a Leader who answers a set of printed questions outlined in the general program and asked of the Leader by the chairman of the session. Those attending the discussions are also permitted to ask questions thus affording the dentist an opportunity to obtain information on the problem with which he is individually concerned.

Commercial houses occupied considerable space with their exhibits. It is interesting and gratifying that there are fewer displays of those products not approved by the Council on Dental Therapeutics.

There is much that those interested in Pharmacy can learn by attending dental conventions. There is a real opportunity for the ethical pharmacist to acquaint himself with the uses dentists have for medication. The pharmacist who is a specialist in his profession will find the dentist willing to go more than half way to do his part in rendering a service with the pharmacist which will aid in advancing public health.

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## COMMITTEE REPORTS

### REPORT OF THE COMMITTEE FOR THE COLLECTION OF INFORMATION PERTAINING TO PROFESSIONAL PHARMACY

BY MARVIN J. ANDREWS *Chairman*

The Committee for the Collection of Information Pertaining to Professional Pharmacy was appointed by Chairman Henry M. Burlage in accordance with a recommendation passed by the Section on Practical Pharmacy and Dispensing at the 1934 meeting held in Washington, D. C.

As implied by the name, the duty of this Committee was to contact (1) Deans of all Schools of Pharmacy, (2) Secretaries of State, City and County Pharmaceutical Associations and (3) Hospital Pharmacies in an effort to collect any information that may be used to promote the best interests of Professional Pharmacy. With this in view it was thought best for the Chairman of the Committee to assume the responsibility of contacting the first two groups, but due to the size of the third group, namely, Hospital Pharmacies, each member of the Committee should assume the responsibility of contacting the hospitals located in the States assigned to them.

With this in view the members of the Committee were assigned to contact the hospitals located in the following States:

Marvin J. Andrews	Delaware, District of Columbia, Maryland, New Jersey and Pennsylvania
Ralph W. Clark <sup>1</sup>	Iowa, Kansas, Missouri and Wisconsin
W. G. Crockett	Kentucky, Ohio, Virginia and West Virginia
Richard D. Franklin	Connecticut, Massachusetts and Rhode Island

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<sup>1</sup> Officers of Section and ex-officio members of the Committee

Elmer I. Hammond	Alabama, Arkansas, Louisiana, Mississippi, Oklahoma and Texas
J. Solon Mordell	Maine, New Hampshire, New York and Vermont
Emery T. Motley	Florida, Georgia, North Carolina, South Carolina and Tennessee
Charles V. Netz	Minnesota, Nebraska, North Dakota and South Dakota
Leon W. Richards <sup>1</sup>	Colorado, Montana and Wyoming
L. Wait Rising <sup>1</sup>	Idaho, New Mexico, Utah and Washington
E. T. Stuhr	Arizona, California, Nevada and Oregon
Ralph E. Terry	Indiana, Illinois and Michigan

As it is impossible to give a detailed report of all the information collected the Committee has decided to summarize all the questionnaires and make a brief general report under each division

#### INFORMATION OBTAINED FROM SCHOOLS OF PHARMACY

In addition to training students in Chemistry, Pharmacognosy, Pharmacology, Pharmacy etc., which is the primary purpose of all Schools of Pharmacy, the questionnaires from 49 Pharmacy Schools revealed that some also take an active part in many other fields which are best summarized as follows

1 Scientific articles are written pertaining to some phase of Pharmacy which are presented before National, State, County and City Pharmaceutical Associations. A great many of these are published in some Pharmaceutical Journal

2 Research is carried on by members of the various faculties in many different fields of Pharmacy

3 Some schools or members of their faculty take an active part in the revision of the U. S. P. and N. F.

4 An active part is taken in National and State Pharmaceutical Associations through which State Laws and regulations for pharmacy have been constantly improved in the last decade

5 Give lectures in Pharmacy to (a) Medical Students, (b) Hospital Interns

6 Conduct pharmacies located in hospitals

7 Prepare U. S. P. and N. F. displays at State or National Medical, Dental or Hospital Association meetings

8 Send out U. S. P. and N. F. Publicity Bulletins or Pamphlets in conjunction with local or State Pharmaceutical Associations

9 Have Student Pharmaceutical Association meetings and conduct an open house night at least once a year

10 Conduct or aid in preparing the programs for the Scientific Section of State Pharmaceutical Associations

11 Aid Retail Pharmacists by (a) acting as consultants in prescription and dispensing problems, (b) loaning apparatus and preparing professional pharmacy window displays, (c) assisting pharmacists in planning their detailing material for the medical and dental professions and also for the laymen

There are no doubt a great many other activities in which Schools of Pharmacy participate but the above data is confined to the actual information obtained from the questionnaires received

#### INFORMATION OBTAINED FROM STATE PHARMACEUTICAL ASSOCIATION SECRETARIES

The questionnaire sent to the State Pharmaceutical Association Secretaries asks for a great amount of information as to the activities of the State, County and City Associations pertaining to the promotion of the best interest of Professional Pharmacy. The four main questions requested are as follows: (1) Does Association have a Committee for promoting Professional Pharmacy? (2) Name of the Committee (3) Who is Chairman of this Committee? Address of Chairman and (4) What type of work is this Committee doing?

At the present time your Committee has had replies from 35 State Secretaries, of which only 13 States have an active Committee to promote the use of U. S. P. and N. F. Products or to contact members of the Medical, Dental or Hospital Associations. Due to the elements of time and expense the Committee has not as yet contacted the County and City Associations listed on the

<sup>1</sup> Officers of Section and ex-officio members of the Committee

questionnaires but will do so next year if it is the desire of the Section and the AMERICAN PHARMACEUTICAL ASSOCIATION

A summary of the activities of the Committees in the States of Illinois, Indiana, Iowa Maryland Minnesota Mississippi, Oregon, New Jersey, New York Ohio, Pennsylvania South Dakota and Wisconsin as supplied on the questionnaires is as follows

1 Annual displays of U S P and N F drugs and preparations at State Dental, Hospital Medical or Pharmaceutical Association meetings

2 Sponsor joint meetings between Dentists Pharmacists and Physicians

3 Prescriptions containing U S P and N F Products are sent to members of the Dental or Medical Associations in one of the following ways (a) Advertisements in Medical Journals, (b) Booklets such as those used in New York, New Jersey and Pennsylvania, (c) On 3" x 5" index cards such as those used in Minnesota and (d) Bulletins printed on the letterhead of the Committee as used in Maryland etc

In a great many of the above mentioned States the pharmacists receive copies of the prescriptions through their State Journals before they are mailed to members of the other professions

The questionnaires from Kansas Montana New Hampshire North Carolina and Rhode Island indicate that these States have appointed or intend to appoint Committees to contact members of professions other than Pharmacy

In addition to the above information a great many State Pharmaceutical Associations are devoting one day of their annual meeting to scientific work for the first time in 1935

#### INFORMATION OBTAINED FROM HOSPITALS

The Committee contacted the larger hospitals in the United States in an effort to collect Hospital Formularies as well as to obtain other data In addition to obtaining the name, address and size of the hospital the following information was requested on the questionnaire (1) Does hospital have an outpatient dispensary? (2) Does hospital have its own hospital formulary? (3) Does hospital have special names for combinations used in the dispensary or throughout hospital? (4) Number of registered pharmacists employed in hospital (5) Name and address of Chief Pharmacist (6) Name and address of all other pharmacists (7) Have any papers been written by members of the Pharmacy Staff? (8) Give author's name and cite bibliographical information i e title of work, name of periodical also year and page reference

To date replies have been received from 381 hospitals, 99 of which sent formularies and 24 stated that their formularies were undergoing revision and when complete a copy would be forwarded The remaining 258 hospitals returned the questionnaires filled out with the notation that the hospital did not have a formulary or that the U S P and N F were used exclusively

The formularies varied from a few handwritten prescriptions to elaborate mimeographed or printed books The prescription combinations contained in the formularies were to be prescribed by one of the following methods (1) by numbers, (2) by special names or (3) to be written out in the form of a prescription

As the space in the JOURNAL and the time for the presentation of this report is limited it will be impossible to give a great deal of specific information which would necessarily be required to summarize the remaining vast amount of information collected by the Committee However it may be well to include a few of the outstanding points that are quite evident upon examining the questionnaires and formularies which were sent to your Committee that may aid other hospital pharmacists in revising their hospital formularies etc, in the future

The constructive criticisms may be briefly summarized as follows

1 A great many of the present formularies are in need of revision as some were printed as far back as 1911 and naturally contain a great many obsolete drugs and prescriptions

2 A definite policy should be established before the prescriptions are written for incorporation in the formularies so that the young physician (Intern) may have a guide that is reasonably correct from a pharmaceutical standpoint The most frequent mistakes found in the formularies collected are (a) The ingredients in the same prescription are written in Latin Abbreviated Latin English or a combination of any or all of the above mentioned instead of using one definite language throughout (b) The quantities of the ingredients are written in either the Avoirdupois Apothecary or Metric System In some instances two different systems are used in the same prescription that is the quantity of the first ingredient is given in grains, the second in grams, etc

We suggest that the quantities of the ingredients be written in the Apothecary System and the conversions into the Metric System be placed to the right in a corresponding column. The following will act as an illustration:

Ingredients Used in Prescription	Amt. in Each Dose		Amt. Usually Prescribed	
	Apoth.	Metric	Apoth.	Metric

(c) There is a continual use of the abbreviation for the Avoirdupois ounce (oz. which equals 437.5 grams) when the abbreviation for the Apothecary ounce (Apoth. oz. or  $\mathfrak{z}$  which equals 480 grams) is desired. Likewise the symbol oz. is used when it should be fl. oz. or fl.  $\mathfrak{z}$ .

3. The galley or page proof of the formulary should be thoroughly proof-read by several qualified pharmacists. Some of the formularies received contain any number of mistakes in spelling the names of drugs as well as conversions of quantities. The general arrangement of the prescriptions, etc., indicate the author or authors know very little or nothing about pharmacy.

The above criticism is given with the view of constructive rather than destructive information in the revision of hospital formularies. A great number of the formularies received by the Committee have been carefully prepared and will accomplish much in the promotion of the best interests of professional pharmacy.

#### RECOMMENDATIONS MADE BY MEMBERS OF THE COMMITTEE

1. This Section in cooperation with the Section on Education and Legislation or the ASSOCIATION should foster a vigorous program to find out wherein the education of pharmacists is lax in respect to the attainment of professional ideals, thereby endeavoring to uplift the dignity of pharmacy as a profession.

2. The Section or the ASSOCIATION should make a survey as to the number of hospitals employing registered pharmacists as compared with those that employ none.

3. The ASSOCIATION should endeavor to enlist the many hospital pharmacists in this country to join the AMERICAN PHARMACEUTICAL ASSOCIATION as these men are the first to actually contact the young physicians after they graduate.

4. The Section or the ASSOCIATION should encourage hospital pharmacists to conduct dignified, scientific laboratories offering every assistance in the way of consultation, research, etc., instead of conducting just a "Pill Dispensing" storeroom.

5. The ASSOCIATION should endeavor to correlate and supply authoritative information that will be of aid to local and state associations in promoting the use of official products.

6. The Section should request the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION to appropriate \$100.00 to be used in purchasing letter size folders and State guides for filing all information collected by the Committee during 1934-1935 and to continue the work during 1935-1936. This information is to be placed in the AMERICAN INSTITUTE OF PHARMACY.

In conclusion, I would like to take this opportunity to thank the members of this Committee and all others that have worked with me during the past year in collecting the information pertaining to professional pharmacy.

#### PHILADELPHIA STUDENT BRANCH A PH. A. PROPOSED

In the last few weeks there has been considerable discussion among the Pharmacy students relative to the fact that there is no student organization of Pharmacy Students. Attention to this fact has been brought to the members of the staff. With a Biological Society and a Chemical Society, it would not seem amiss in a college of Pharmacy to have a Pharmaceutical Society.

Other colleges have solved the problem with a student branch of the AMERICAN PHARMACEUTICAL ASSOCIATION. This seems to be the most logical type of organization to further the professional and technical side of Pharmacy. With an organization of this kind in the college, the Pharmacy students will have all the advantages of membership in the AMERICAN PHARMACEUTICAL ASSOCIATION, although not eligible for actual membership until graduation.

Matters of pharmaceutical interest will be discussed at the meetings as well as articles from the JOURNAL. Entry information will also be given to the group from the ASSOCIATION.



## PROCEEDINGS OF THE LOCAL BRANCHES

'All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council' —Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association "

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication may elect one representative to the House of Delegates "

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter *Please advise us of changes in Roster and mail reports promptly*

### CHICAGO

The monthly meeting of the Chicago Branch of the A PH A was held Tuesday evening, December 10th at the University of Illinois College of Pharmacy

President S W Morrison appointed the following nominating committee for officers of the coming year W B Day, *Chairman*, I A Becker C F Lanwermyer

A resolution of condolence was passed to Mrs Fred W Meissner, whose late husband was one of the oldest members of the Branch

The speaker of the evening was Dr Julius Hess president of the Chicago Medical Society, who spoke on *The Value of Serum Therapy* "

According to Dr Hess, serums are thought of mainly as to curative value, but in reality, are active for only a few months

Emphasis was placed on the fact that one should always prepare for an anaphylactic shock when using serums where they have been used before From his own experiences Dr Hess has a fear of repeated antitoxins

Slides were shown giving statistical data of the deaths in Chicago from the year 1833 to 1930, due to diseases Important steps in curtailment of these diseases were also listed A decided advance in preventative medicine was noticed by the decline in deaths from diphtheria, smallpox, malaria, tuberculosis typhoid and infantile paralysis

The antitoxins were discussed individually in the following order

*Diphtheria* —The danger is in not diagnosing the case early enough and in not giving enough antitoxin In advanced cases the antitoxin should be given intravenously Large early doses are advised

*Tetanus* —Those cases that develop in eight to ten days are difficult to treat In prophylaxis treatment Dr Hess recommends that in these cases the regular dose of 1500 units be increased to many times that amount If the original wound is reopened at any time it is recommended that a fresh injection of the antitoxin be given The curative dose depends upon the virulence of the organism and the resistance of the patient

In recent work at the Cook County Hospital the patients have first been given 50 mg per Kg of body weight of Avertan rectally Spinal punctures are no longer given as this upsets the patient It was suggested that the antitoxin be given intravenously in 60,000 to 200 000 units

*Erysipelas* —This is a streptococcus disease and at one time played terrific havoc with new born babies and mothers As made to-day it is both antitoxic and antibacterial in action It usually takes repeated doses to cure, convalescence serum is an aid in treatment In severest cases and if other serums have failed massive transfusions of the blood of recently recovered patients should be used

*Scarlet Fever*—This is also a streptococcus disease. The question arises of prophylaxis in the presence of the disease. The incubation period of the disease is from five to eight days.

If a horse serum is used the patient is sensitized, it is suggested that large curative doses be given as this sensitizes no more than a small dose. The safest way to minimize contacts is to give the blood of those who have had scarlet fever. For prevention the Dick vaccine can be given. At first many patients were found who did not remain immune, but larger doses are given now and Dr. Hess practices and recommends its use.

*Meningitis*—This treatment should be given intraspinally. Where extra spinal symptoms are outstanding the injection should be made intramuscularly. In the opinion of Dr. Hess the first dose should be given partly in the spine and partly in the vein.

The following serums were discussed in order.

*Antipneumococcus Serum*—There is still much to learn of pneumonia. A study is now being made of human convalescent serum and two cases of children were mentioned as now convalescing after this treatment. One child was of the No. 3 type and the other was No. 4 type. 200 cc. of the serum were injected.

*Antidysentery Serum*—Use is made of this serum and results have been obtained in some cases.

*Polio-myelitis Serum*—Dr. Hess believes that human convalescence serum has a place in the treatment of this disease. A case was cited where a boy's life was saved by the injection of 240 cc. of it. Cases should be absolutely isolated.

*Measles*—This common disease is now 90% preventative. Placental extract is now being used more or less as an experiment. Human convalescent serum is not practical as it is hard to get measles blood as blood is not drawn from children as a rule.

*Chicken Pox*—We have only human convalescent serum for treatment.

*Mumps*—Mumps can be checked and modified with 5 cc. of human convalescent serum. In the early stages larger doses of the serum will modify after the disease has developed.

*Pertussis*—Vaccination is recommended against pertussis. The vaccination must be given at least six weeks before exposure. There have been some very good results. Some 600 children were given the vaccinations wherein only three cases developed. It is questionable how long the immunization will last.

The meeting was closed by an open discussion with remarks of particular importance by Dr. Fantus and O. U. Sisson.

L. TEMPLETON, *Secretary-Treasurer*

## NEW YORK

By invitation of the Kings County Pharmaceutical Society, the December 9, 1935, meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Brooklyn College of Pharmacy, Long Island University. About seventy-five members and their guests attended.

The meeting was called to order by President Ballard who thanked the Brooklyn College of Pharmacy for the opportunity of assembling in their building. The minutes of the previous meeting were read and approved. The report of Treasurer Currens was submitted.

Chairman Lehman, of Committee on Education and Legislation, then reported as follows.

*National Legislation*—Of foremost interest to the pharmaceutical profession, before the next session of Congress are the following bills: Robinson Patman Anti price Discrimination Bill, H. R. 8442, Robinson-Tydings National Fair Trade enabling act, Copeland (Tugwell) Bill, Food and Drug Reform.

The first makes it unlawful for any person engaged in commerce to discriminate in price or terms between purchasers of commodities of like grade and quality, to prohibit the payment of brokerage or commission under certain conditions, to suppress pseudo advertising allowances to provide a presumptive measure of damages in certain cases, and to protect the independent merchant, the public whom he serves, the manufacturer from whom he buys, from exploitation by unfair competitors, etc.

The second permits price standardization by amending the Federal Trade law, Section 1, as follows: Provided that nothing herein contained shall render illegal contracts or agreements prescribing the minimum prices for the sale or resale of a commodity which bears the trade-

mark brand or the name of the producer or owner of such commodity and which is in fair competition with commodities of the same general class produced by others when such contracts or agreements are lawful under any statute now or hereafter in effect in any state, territory or the District of Columbia in which such sale or resale is to be made and the making of such contracts or agreements shall not be an unfair method of competition under Section 45, Title 15, U S C

The Copeland Food and Drugs bill will be pushed forward vigorously it is reported

The Federal Trade Commission has approved a rule prohibiting sales below cost "with the intent and with the effect of injuring a competitor where the effect may be to substantially lessen competition or tend to create a monopoly or to unreasonably restrain trade, cost being determined by including all elements recognized by good accounting practices "

Under the New York State Fair Trade Law, the following suits were tried

Cooper and Cooper *vs* Angert temporary injunction granted

Doubleday Doran Co *vs* Macy temporary injunction denied

Coty *vs* Hearns Dept Stores temporary injunction denied

Seeck & Kade Co *vs* Tomschinsky temporary injunction denied

The first case tried before Judge Brennan in Brooklyn, the second and fourth by Judge Close in White Plains the third case before Judge Roseman in New York City

Appeals are being argued in Albany, at present on the three last ones and a decision is hoped for in January

There is also a case of Retailer against Retailer under Section two of the act Harry Dolen *vs* Salzman & Bromberg of which there is no report up to this time

The Fair Trade Committee asks the member of the pharmaceutical profession to reserve judgment and not worry unnecessarily about the outcome of the matter

About 125 deputy inspectors were appointed by the New York State Board of Pharmacy under the appropriation granted by the Federal Government and these men and women are doing effective work in remedying abuses in illegal and sub standard sales in non pharmaceutical stores

I have before me a letter from the New York State Pharmacist enclosing a galley proof of an article showing that the pharmacist must pay the following number of taxes New York City taxes, 8, State Taxes 7 and Federal Taxes 12 However, the *Bulletin* of the California State Association lists not less than 52 (fifty two) Federal taxes and what is good for the Golden State must be good in the Empire State

F C A Schaefer Branch Delegate to the New York Pharmaceutical Council submitted the following report Another mass meeting is to be held on the evening of December 10, at 9 30 P M, in the Hotel Pennsylvania, the object being to further the application of the new Fair Trade Act Steps are being taken to organize Manhattan pharmaceutically as has so success fully been done in other Boroughs of the city

Chairman Steiger, of Progress of Pharmacy Committee reported as follows

Two interesting articles on Unsaturated Fatty Acids appear in *Drug Trade News* for Nov 25th The first quotes Dr August J Pocini of the Pharmaceutical Specialties Co He claims that linoleic and linolenic acids are effective in preventing head colds because head colds start as a hay fever like allergic condition which can be treated by the use of these acids Pocini points to several years of research by many workers including Oncken, Burrs Hansen and Corubleet tracing the effects of unsaturated fatty acids in various allergic conditions, to the final conclusion that head colds may be prevented by restoration to the diet of the unsaturated fatty acids that industry has removed

The second article refers to the researches of Dr F E Chidester His claim is that the unsaturated fatty acids in combination with traces of organic iodine constitute a powerful tool in the hands of medicine for the cure and prevention of a large number of diseases due to glandular unbalance Dr Chidester's finding that the unsaturated fatty acids are a valuable factor in the control of the common cold is but a special limited application of a much broader theory which involves the interaction and interdependence of all the vitamins the iodine fat balance of the human metabolism the thyroid secretion and human nutrition in general "

A patent granted to G B Walden, assigned to Eli Lilly & Co, describes the production of a highly effective concentrated anti anemic substance from stomach tissue

Pharmacy in Germany, as recently reorganized is reported by the *Pharmazeutische Zeitung*, which prints the long list of professional regulations which strictly govern the conduct of German pharmacies A few of the regulations follow

No 1 The Pharmacy is an institution of the State Public Health Service Its task consists in service for the public welfare Striving after profit must take second place to the achievement of this purpose (Regulations Nos 2 to 5 are familiar ethical standards)

No 6 Methods are forbidden which have as their object the capture of business in an unfair manner Particular instances of such methods are (These are numerous and are numbered alphabetically I will quote only a few)

f Fraudulent claims that the pharmacy has a privileged position

g The use of misleading terms in describing or recommending medicaments, for instance "the only genuine," "only to be had at Blank's," etc

m Arrangements with doctors or other persons who treat sickness whereby medicaments are ordered under brand names and descriptions which prevent their being compounded by any other pharmacist

n Supplying drugs to persons for purpose of door-to door selling

No 7 Breaches of these regulations will be dealt with by professional tribunals

Under the heading of Communications a letter from Chairman A Zieffe of A Ph A Committee on Local Branches, was read This letter called upon the local branches to communicate their ideas and suggestions for improving and strengthening the local branches The resolution submitted by the N Y Branch at the Portland Convention was quoted in part The matter was discussed but no action was taken Dr Schaefer pointed out that a meeting of the A Ph A Council had taken place on December 6th and it would be advisable to find out what action had been taken on the N Y Branch resolution

President Ballard appointed the following to membership on the Nominating Committee to report at the next meeting Peter Conroy Lewis N Brown Robert S Lehman *Chairman*

The chairman then introduced the speaker for the evening Dr Albert F R Andresen who discussed 'The Fallacies of Symptomatic Treatment in Gastro Intestinal Diseases'

The speaker referred to some of the essentials of the anatomy and physiology of the gastro intestinal tract This was important for a clear understanding of the discussion which followed Dr Andresen was careful to make clear that substances within the gastro intestinal tract were not within the body but in a canal or tube which went through the body

He explained that the stomach is one of the most abused organs Many irritating substances find their way to the stomach and greater care should be given to avoiding excessively hot or cold foods

Dr Andresen enumerated some of the common symptoms observed by people suffering with various disorders of the gastro intestinal tract He stated that frequently the "home treatment" used was the cause of serious damage due to the fact that the symptoms had been misinterpreted The speaker was particularly careful to point out that abdominal pains did not always indicate a stomach or intestinal disorder, but were frequently the result of a ruptured appendix, gall stones or even coronary thrombosis

The layman does not realize the dangers of home treatment when he employs cathartics and enemas in cases where vomiting cramps and perhaps constipation occurs Many such instances have turned out to be caused by an intestinal obstruction and quick surgical action was necessary to save the patient's life

Gastric ulcer was then discussed and the speaker said that this was a condition which was very much overtreated to day Regulation of diet was all that was needed, medication being wholly unnecessary

A point which few people realize is that diarrhea is far more serious than constipation In all cases the cause of diarrhea should be determined since it is frequently a symptom of infectious disease Cancer of the bowel causes diarrhea and the speaker mentioned that this was one of the most easily treated types of cancer particularly in early states

In conclusion Dr Andresen explained that all the symptoms of gastro intestinal disorder

might be caused by allergy It is therefore, important to determine the cause of the symptom and we should not trust ourselves to ordinary home remedies

A discussion followed in which the speaker and Messrs Seley Milliman, Maistelman Ballard Schroeder and Schaefer took part In the discussion the following additional points were brought out

Stomach ulcers form rather quickly often in 2 to 4 hours Food especially that containing large residue, along with water constitutes the safest and best laxative

The taking of bran and other roughage can be carried to a point of producing actual harm by packing the bowel

Some persons are sensitive to phenolphthalein, and it is an irritant in any event

When a laxative is needed constantly, change should be resorted to, it is then best to experiment with different laxatives

Psyllum seed in excess can do harm by causing impaction

Smoking of tobacco can cause symptoms of stomach or intestinal disorder by allergic reactions

Following the discussion Dr Ballard thanked the speaker and a rising vote of thanks was given the speaker

RUDOLF O HAUCK *Secretary*

(See Philadelphia page 53 Northern Ohio Branch will appear in February JOURNAL)

## ASSOCIATION BUSINESS

### AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1935-1936

Office of the Secretary 2215 Constitution Ave Washington, D C

LETTER NO 11

January 13 1936

*To the Members of the Council*

74 *Minutes of the Meeting of the Council on December 5 1935* Comments were received from two members Dr Swain approved the minutes as submitted Dr Fischelis requested three changes which have been made in pages 27 28 and 29 Corrected copies are sent herewith and the members are requested to substitute them for the pages bearing the same numbers, in Council Letter No 10

(*Motion No 32*) It is moved by Eberle that the minutes of the meetings of the Council on December 5 1935 as given in Letter No 10 and as corrected be approved

75 *Bequest of Dr Frederick B Kilmer* See Items 70, Letter No 12 75 in Letter No 14, and 115 in Letter No 22 1934-1935 The following letter has been received from Charles M Morris Counselor at Law New Brunswick N J

I represent the Executors of the Estate of Frederick B Kilmer, late of New Brunswick deceased

The Executors desire to pay the bequest of \$3000 00 under the terms of the Will and I herewith enclose a release which I would thank you to have executed and returned to me, upon receipt of the release properly executed I will forward check for \$3000 00 in payment of the bequest

The release is as follows

Know all men by these presents that whereas Frederick B Kilmer, late of the City of New Brunswick in the County of Middlesex and State of New Jersey, deceased in and by his last Will and Testament duly proved before the Surrogate of the County of Middlesex, did give and bequeath as follows

'I give and bequeath unto the AMERICAN PHARMACEUTICAL ASSOCIATION, organized under the District of Columbia the sum of Three Thousand Dollars to be held in trust, the income to be applied to the awarding of a prize for meritorious work in pharmacognosy, such prize to be known

as 'The Kilmer Prize,' or an equivalent designation. In awarding the prize preference to be given to studies in vegetable drugs. The recipient of the prize shall be a graduate in pharmacy. Teachers in colleges of pharmacy, workers in pharmaceutical laboratories are to be excluded from competing for the prize. Prize to be awarded under such conditions as the ASSOCIATION may elect. Funds arising from the income which may not be used are to be added to the amount of the prize or added to the principal, as the ASSOCIATION may elect."

and in and by said Will and Testament did nominate and appoint Josephine I. Dooley and Lewis Sceva Executors thereof

Now therefore the said AMERICAN PHARMACEUTICAL ASSOCIATION does hereby acknowledge that it has received from the said Josephine I. Dooley and Lewis Sceva, Executors as aforesaid, the sum of Three Thousand Dollars (\$3000 00) in full for the legacy to it bequeathed in and by the last Will of the said Frederick B. Kilmer as aforesaid, and by these presents does for itself, its successors, remise, release and forever discharge the said Josephine I. Dooley and Lewis Sceva, Executors as aforesaid, their heirs, executors and administrators, of and from all claims and demands whatsoever in law or in equity which against the said Josephine I. Dooley and Lewis Sceva, or against the said Estate of Frederick B. Kilmer, deceased, it has or shall have by reason of the aforesaid legacy.

In witness whereof, the said AMERICAN PHARMACEUTICAL ASSOCIATION has caused these presents to be signed by its duly authorized officers and its corporate seal to be hereto affixed this day of                      Nineteen Hundred Thirty Five

AMERICAN PHARMACEUTICAL ASSOCIATION  
By

ATTEST

(*Motion No. 33*) It is moved by Philip that the secretary be and is hereby authorized to execute the release requested by the executors of the Will of the late Dr. Frederick B. Kilmer and that the treasurer be authorized to deposit the check for \$3000 00 in a permanent fund to be known as the F. B. Kilmer Fund.

A vote is called for at this time but will be considered as tentative if there is comment or objection.

76 *Proposed Publication* In accordance with Motion No. 20 (see Council Letter No. 10, page 1110), Chairman Hilton has appointed the following special committees:

*Committee on Contents, Scope and Style*—R. L. Swain, *Chairman*, A. G. DuMez, R. P. Fischels, H. V. Army and F. A. Delgado.

*Committee on Ways and Means*—C. W. Holton, *Chairman*, H. A. B. Dunning, W. D. Adams, W. B. Philip and J. Lester Hayman.

77 *Contract for Printing and Mailing the Journal for 1936* In accordance with the motion adopted by the Council (see Council Letter No. 10, page 1110), bids were obtained from the firms that have in recent years been invited to bid. After a careful study of the bids as submitted, Chairman DuMez recommends that the contract with the Mack Printing Company be renewed for 1936 on the basis of the contract for 1935, and Editor Eberle concurs in this recommendation.

(*Motion No. 34*) It is moved by DuMez that the contract for printing and mailing the JOURNAL for 1936 be awarded to the Mack Printing Company of Easton, Pa. At the request of Chairman DuMez a vote is called for at this time but will be considered as tentative if there is objection.

78 *Budget for 1936* Chairman Philip of the Committee on Finance submits in accordance with Article II of the By Laws of the Council the following report on appropriations and expenditures for 1935 with a proposed budget of receipts and appropriations for 1936 which were prepared by the secretary and approved by the Committee on Finance.

An addition was made to the appropriations for General Expenses in 1935—\$20 00 for the Committee on Horticultural Nomenclature. Of the appropriations for General Expenses three were exceeded to December 1st:

The disbursements for Telegraph and Telephone were \$217 03 against \$200 00.

The disbursements for Office Supplies were \$161 46 against \$150 00.

The disbursements for Traveling Expenses were \$602 24 against \$500 00.

The first two are within the \$50 00 limit for which no Council action is required, the latter is due to the travel incidental to national legislation. The disbursements for General Expenses to December 1st totaled \$15,084 33 against \$23,050 00 appropriated.

Under the appropriations for Open Accounts, the disbursements to December 1st were as follows:

The disbursements for the JOURNAL were \$5228 48 against \$11,000 00

The disbursements for the N F were \$3876 26 against \$1000 00

The disbursements for the R B were \$680 27 against \$500 00

The disbursements for Badges and Bars no disbursement against \$50 00

To December 1st the total disbursements for General Expenses and for Open Accounts were \$24 869 39 against \$35 600 00 and the budget will not be exceeded although some heavy payments will be made in December since a considerable proportion of the annual income is received in that month.

The receipts to December 1st vary considerably from the receipts for the same period in 1934.

From Dues, \$7592 88 against \$7369 48. Bills for dues for 1936 were mailed on December 1st and it is impossible to estimate the total for the year, although the increase so far is encouraging.

From the JOURNAL \$6958 37 against \$8529 85. A payment made early in December which should have been received in November would have brought the total to about \$7900 00.

From the National Formulary, \$1624 74 against \$2737 27.

From the Recipe Book \$425 34 against \$1228 32.

From the YEAR BOOK \$3144 74 of which \$2000 00 was billed in December 1934 and was due for that year.

It was necessary to use the income from the Life Membership Fund and to transfer \$2000 00 of the accumulated interest to the Current Fund.

It is hoped that the arrangement recently made for budgeting the expenses of the N F revision and the completion of the YEAR BOOK series in 1936 will make it possible to again balance the annual budget.

In submitting the following estimate of receipts during 1936 only a part of the expected receipts from the N F and R B are given as it is the desire of the Committee to budget the receipts more equally over the ten-year period. No doubt the total receipts from these publications will be materially larger than the estimates. The following is suggested:

Dues	\$13 000 00
Interest Life Membership Fund	1 100 00
JOURNAL	9 500 00
National Formulary	17 500 00
Recipe Book	3 000 00
YEAR BOOK and Abstracts	1 200 00
<b>Total</b>	<b>\$45 300 00</b>

It will be recalled that during 1935, Volume 22 of the YEAR BOOK was issued and that the Pharmaceutical Abstracts for 1935 were published monthly in the JOURNAL. Volume 23 of the YEAR BOOK which is the last of the series will be issued in 1936 and the Pharmaceutical Abstracts for 1936 will be carried in the JOURNAL. It is therefore, necessary to include in the Budget for General Expenses \$3500 00 for the YEAR BOOK and also to increase the appropriation for the JOURNAL in the budget for Open Accounts from \$11 000 00 to \$15 000 00 to cover the expenses of the Abstracts. This double charge will not be necessary after 1936. The appropriations for the N F and R B in the following proposed budget have been increased to take care of the revision expenses.

#### APPROPRIATIONS FOR GENERAL EXPENSES

No 1	Salaries	\$11 700 00
No 2	Maintenance of Building	3 500 00
No 3	Telegraph and Telephone	200 00
No 4	Clerical Expenses	1 200 00

No 5	Printing, Postage and Stationery	700 00	
No 6	Office Supplies	150 00	
No 7	Traveling Expenses	750 00	
No 8	Premium on Bonds	50 00	
No 9	Auditing	75 00	
No 10	Certificates	50 00	
No 11	Miscellaneous	200 00	
No 12	Scientific Section	25 00	
No 13	Section on Education and Legislation	25 00	
No 14	Section on Practical Pharmacy and Dispensing	25 00	
No 15	Section on Commercial Interests	25 00	
No 16	Section on Historical Pharmacy	25 00	
No 17	Committee on Proprietary Medicine	100 00	
No 18	Committee on Local Branches	25 00	
No 19	Committee on Membership	500 00	
No 20	Committee on State and National Legislation	50 00	
No 21	Committee on Syllabus	50 00	
No 22	Committee on Pharmacy Week	500 00	
No 23	Inter Society Color Council	25 00	
No 24	Committee on Emblem	50 00	
No 25	International Pharmaceutical Federation	120 00	
No 26	Metric Association	10 00	
No 27	American Council on Pharmaceutical Education	200 00	
No 28	YEAR BOOK	3,500 00	
No 29	Library	50 00	\$23 880 00

## APPROPRIATIONS FOR OPEN ACCOUNTS

No 30	JOURNAL		
	(a) Publication	\$ 9 300 00	
	(b) Clerical Expense	1,200 00	
	(c) Postage and Stationery	300 00	
	(d) Freight, Drayage and Miscellaneous	200 00	
	(e) Abstracts	4 000 00	
		<u>\$15 000 00</u>	
No 31	National Formulary		
	(a) Clerical Expenses	\$1,100 00	
	(b) Bulletins	500 00	
	(c) Supplies and Miscellaneous	200 00	
	(d) Chairman's Traveling Expenses	400 00	
	(e) Publicity and Exhibits	300 00	
	(f) Investigation, Revision	2 500 00	
		<u>\$5,000 00</u>	
No 32	Recipe Book	\$ 750 00	
No 33	Badges and Bars	50 00	\$20 800 00
		<u></u>	<u>\$44 680 00</u>

It will be noted that the appropriations for Traveling Expenses and for the Committees on Proprietary Medicines, on Membership and on Pharmacy Week have been increased and that \$50 00 is added to the budget for the special Committee on Emblem at the request of its Chairman, George D. Berl. Although the receipts will probably be higher than the estimates, it will be necessary to continue to curtail expenses wherever possible in order to conserve the balance for later years when receipts will be less.



Later it will probably be necessary to make additions to the budget to extend present activities and to cover the new activities which have been proposed and are under consideration

(*Motion No 35*) It is moved by Philip that the budget for 1936 be approved as submitted With the approval of the chairman of the Council a vote is called for at this time It will be considered as tentative if there is objection

79 *Selection of Auditors* The chairman of the Committee on Finance recommends the employment of W A Johnson & Co, Baltimore, Md, to audit the accounts of the ASSOCIATION for 1935 in accordance with Article VIII of Chapter IV of the By-Laws This Company has audited the accounts since 1922 The appropriation for the audit has been \$75 00 for each year

(*Motion No 36*) It is moved by Philip that W A Johnson & Co be employed to audit the accounts of the ASSOCIATION for 1935

80 *Applicants for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received

No 135 Russel John Fosbinder, 250 High St Newark N J, No 136 Richard Henry Gerkenmeyer, 1345 Washtenaw Ave, Ann Arbor Mich, No 137 George Alfred Clapesattle, 1130 Neil Ave, Columbus Ohio, No 138 Thomas W Bishop 2804 N E 36th Ave Portland, Ore, No 139 Geo Lloyd Bunting, 32nd & Falls Cliff Rd, Baltimore Md No 140, Homer John Welty 3520 Fulton St San Francisco Calif No 141 Abdul Fattah Mallah, American University, Beirut, Syria, No 142, Harold Beach 701 Lake St, Topeka, Kans No 143 Albert M Slaght 80 Wheeler St, West Orange, N J, No 144 Edward W Jackson, 200 Ballantine Parkway Newark N J, No 145 Louis F Bishop, 1172 Park Ave New York N Y, No 146 Louis F Bishop Jr 121 E 60th St New York, N Y, No 147, Vreeland Tompkins 572 Com mumpaw Ave, Jersey City N J No 148 Nat Kessler 9 Clinton St Newark N J No 149 Robert C Clothier Rutgers University, New Brunswick N J, No 150 Charles T Root, C C C Camp Stronge Mich No 151 Ralph Henry Auch 3449 Custer Ave Cincinnati Ohio No 152 Amos Ludwig Kroupa, University Hospital, Ann Arbor, Mich, No 153, Harold M Herrin Winder Ga, No 154 J L Hawk 1176 Peachtree St Atlanta Ga, No 155 R M Mitchell Griffin Ga No 156 R C Coleman, State Capitol Atlanta Ga No 157, Walter L West Sandersville Ga, No 158, A A Evanson, Fargo Clinic Fargo, N D, No 159 Lyle Reimers Stanley N Dak, No 160 A E Erickson 641—1 Ave N, Fargo N Dak No 161 Charles Tuffiash 37 No Munn Ave Newark, N J, No 162 Abram Mosler 268 Main St Orange, N J, No 163 Wm G Mennen, 345 Central Ave Newark N J, No 164 Frank G Abbott, 345 Central Ave Newark, N J, No 165, Walter Dennis Griffin Jr P Delta Sigma House Gainesville Fla, No 166 Herbert Mitchell Webb P O Box 2148, Gainesville Fla, No 167 C Howard Lapouraille 1435 Orleans St, Baltimore Md, No 168 Reba Malin Box 68 Glendale Calif No 169 Robert Clayton Pursell, Rivervale Rd, Park Ridge N J, No 170 J Jampolsky 2, King George Ave Jerusalem Palestine, No 171 Louis Thomas Bragassa, Jr 1516 Thomas St, Gainesville, Fla, No 172 Morris Schneider, 1111 W Masonic St Gainesville, Fla, No 173 Ernest R Zuick, 1226 Rialto Ave, San Bernardino Calif

(*Motion No 37*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION

E F KELLY, *Secretary*

## ARMY MEDICAL LIBRARY

The Army Medical Library Washington has received a gift of rare books from Dr Ernest Cushing Richardson emeritus director of the Princeton University Library and consultant in bibliography and research of the Library of Congress The Library is enriched by approximately 3000 rare publications of the eighteenth and nineteenth centuries acquired

in Europe some years ago by Dr Richardson

The chief item of the collection is a set of nearly 2000 items on mineral waters, collected by the former superintendent of public health of Bassano, Italy Material of this kind is now extremely rare and difficult to obtain through the regular book channels Among other rare medical books included in the gift is one on human anatomy published in Naples in 1718 by Philippus Verheyen

# THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS  
DEPARTMENT

Some may question the wisdom of a College of Pharmacy offering courses that involve food analysis on the assumption that Agriculture and Home Economic Colleges should give such courses. Professor Glover makes it clear why Colleges of Pharmacy are especially fitted to prepare analysts for state and federal laboratories and for control laboratories. All persons interested in such a course in food and drug analysis will find Professor Glover's paper worth perusing as it contains many valuable suggestions regarding the teaching of such a course—  
C B JORDAN *Editor*

## TEACHING OF FOOD AND DRUG ANALYSIS

BY C C GLOVER \*

Soon after the enactment of the Pure Food and Drug Act in 1906 it became apparent that men and women training for positions in state, federal and municipal laboratories maintained as a necessary part of the enforcement machinery should have something more than a straight chemical preparation. Agricultural colleges were able to supply chemists equipped to handle the food work and colleges of pharmacy could meet the demand for drug analysts, but the ideal combination of training in both food and drug analysis in the same school was hard to get. Since agricultural colleges were not equipped to furnish the necessary training about drugs, it was only natural that some colleges of pharmacy should undertake to supply the demand by adding food analysis to the pharmaceutical curriculum which already included an adequate chemical background.

The Food and Drug Act at once adopted the U S P and N F tests for identity and purity and assay procedure, but methods for food analysis and control had to be developed through the medium of the Association of Agricultural Chemists. Analytical procedures for food control have been developed and perfected and official methods of food analysis are published in book form under the title of "Official and Tentative Methods of Analysis."

The food and drug chemist must not only be a competent analyst but must further be capable of presenting evidence in court. Some knowledge of court procedure is therefore highly desirable. With these requirements in mind the training of the food and drug chemist should include not only laboratory exercises to familiarize the student with the various analytical procedures necessary to check the identity, quality and purity of various foods, beverages, confectionery and condiments, but also interpretation of analytical results should be discussed and library reference reading assigned in order to acquaint the student with the literature in this special field.

Experience has shown that most of the fundamentals in a laboratory course in food analysis may be covered in a single semester of three or four hours' credit, leaving a second semester of two or three additional hours for more advanced study.

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\* Professor of Pharmacognosy, University of Michigan

It is here assumed that students are not ready to take up a course in food analysis until they have had qualitative and quantitative analysis and organic chemistry Too often, in order to save time in laboratory courses, most of the reagents and volumetric solutions are prepared for the students, but we believe that the preparation of some of these solutions and reagents have a decided instructional value and will tend to give the worker greater confidence when later entering a control laboratory

Laboratory exercises should be carefully selected to include the use of all the special apparatus and instruments commonly employed in the up-to-date laboratory The skill and accuracy of each student may be developed and checked at will by preparing unknowns for analysis whose composition is known to the instructor and the results reported may be graded not only according to accuracy, but also upon the speed of the worker For one student may promptly report the correct result of an analysis while another may require double the time or may spoil the unknown and require a refill two or three times before completing the analysis

Report blanks may be provided in printed forms which have space for analytical data and the interpretation of results by the analyst

In order to impress the laboratory worker with the necessity for care in handling expensive laboratory equipment, students may be requested to prepare a list of all special apparatus required in a modern analytical laboratory and to estimate the cost of equipment after consulting apparatus catalogs

Nearly a third of the lecture or class-room periods may well be devoted to the working of mathematical problems based upon laboratory data, for too often a student, after completing a quantitative laboratory experiment, is unable to complete the necessary calculations or may not know the reasons why if able to follow detailed instructions

The importance of alcohol determinations seems to justify the analysis of two or more beverages both for per cent of alcohol and denaturants This exercise includes work with the immersion refractometer and Geissler pycnometer

The detection of artificial food colors may be presented by giving each student at least five solutions and two or more colored candies

A vinegar analysis involves a variety of tests both qualitative and quantitative and requires the use of the polariscope Likewise, vanilla extract analysis provides opportunity for use of the colorimeter and the tintometer

Although modern sterilization processes in canning would seem to make the use of chemical preservatives unnecessary, nevertheless, such products as catsup have been found on the market containing a liberal amount of sodium fluoride and hamburger steak and other ground meats are too often loaded with sulphites

In the opinion of the writer work on butter and milk had best be preceded by a study of salad oils and fats and usually these three last mentioned items are best placed at the end of the course because of their complexity Laboratory work with this group brings into use the Abbé Refractometer, Westphal Balance, viscosimeter, lactometer, Babcock apparatus and many others

To a course of four hours may be added baking powder analysis involving gasometric apparatus, work on spices and condiments, and spore and mold counting in tomato products The determination of spray residues from the use of insecticides

offers an interesting field and one which is steadily growing in importance to the health of our nation

In conclusion, while recognizing the importance of developing skill in laboratory technique, we believe that too much emphasis cannot be laid upon the importance of reference reading and habitual contact with current literature

As a necessary stimulus to that end we have found it very effective to prepare lists of questions on each subject covered in the laboratory outline which the student is required to answer in writing and hand in to the instructor. Such written reports not only serve to direct the student in his reading but also supply the instructor with another check upon the diligence and comprehension of each student

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### MINIMUM STANDARDS FOR A HOSPITAL PHARMACY \*

BY EDWARD SPEASE<sup>1</sup> AND ROBERT M. PORTER<sup>2</sup>

It goes without saying that any one person who attempts to outline these standards will be governed entirely by his own experiences and observations. It is our belief that the necessity for pharmaceutical service in hospitals is now so generally accepted that it is unnecessary to discuss it in this paper.

It would appear that the thing most needed at the present time is the development of a set of principles which can govern those whose duty it is to inspect and approve hospitals. Hospitals are of so many different types and serve such a variety of purposes that, if we should make the attempt to set forth a detailed list of standards, equipment and procedures, we should only provoke endless and futile discussions and so it would seem wise to leave the details which in time will become necessary to be decided in a more orderly manner.

We might offer as a suggested method that a committee chosen from each of the existing hospital associations with the inspecting organization's representative as arbiter would very quickly settle all details.

We have already submitted five principles to Dr. MacEachern of the American College of Surgeons and receiving no adverse criticism of them we shall again present them here with some explanation of them attached.

#### PRINCIPLE NO. 1

Every hospital must have pharmaceutical service

- (a) The full time of a graduate registered pharmacist or
- (b) Pharmaceutical service from an approved adjacent pharmacy

Under the heading (a) there will be some opposition to the use of the word, "graduate." We have given this subject much thought and inasmuch as these are principles to guide an inspecting officer and are not statute law it would seem to us wise to retain this word. No organization working for the good of hospitals would insist upon the removal of a pharmacist because he or she is not a college graduate if the service can be satisfactory, but if due consideration is to be given to the safety of the patient and if necessary service and cooperation is to be offered to the physician it appears that all replacements and all new pharmacists added should be graduates of recognized colleges of pharmacy.

Under the heading (b) there are no standards for an approved pharmacy but as the AMERICAN PHARMACEUTICAL ASSOCIATION is now considering such standards it would appear that their

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\* Presented at the Clinical Congress of the American College of Surgeons, Hospital Standardization Conference, San Francisco, October 28–November 1, 1935.

<sup>1</sup> Dean of the School of Pharmacy, Western Reserve University and Directing Pharmacist of the University Hospitals of Cleveland.

<sup>2</sup> Instructor in Pharmacy, School of Pharmacy, Western Reserve University and Pharmacist of the University Hospitals of Cleveland.

steps will be hastened if they should observe that hospitals and medical associations may find it necessary to have such standards promulgated

It may be of interest to mention that the New York pharmacy laws now prescribe a minimum list of equipment for a registered pharmacy. If this list be chosen as a working basis only, a few items would have to be added for pharmaceutical service to small hospitals

#### PRINCIPLE NO 2

A pharmacy committee shall be appointed, the members of which shall be chosen from the several divisions of the medical staff, for the purpose of determining the policy of operation of the pharmacy, addition to and deletion from the drugs used, such other matters of a pharmaceutical nature as from time to time are necessary, and supervision of purchase and issuance of drugs chemicals, pharmaceutical preparations, biologicals and professional supplies within the hospital. This committee shall meet at regular intervals. The Pharmacist shall be a member of it and serve as its secretary and a transcript of its proceedings shall be kept and a copy forwarded by the secretary to the proper governing body of the hospital

For clarity of discussion we are listing briefly, what Principle No 2 contains

- (a) Establishment of a Pharmacy Committee and its duties
- (b) Supervision by this committee of the purchase and issuance of drugs chemicals pharmaceutical preparations, biologicals and professional supplies

(a) The establishment of a Pharmacy Committee which in our Hospitals is composed of the Associate Professors of Medicine Surgery Pediatrics, Gynecology and Obstetrics, a Clinical Instructor in Medicine the Dean of the School of Pharmacy and the Chief Pharmacist, has been the most important step taken to insure proper pharmaceutical service. In many hospitals the Committee may not need to be so large but surely both medicine and surgery as well as pharmacy should be represented and also any other department that is particularly accented by that hospital. What we are seeking to avoid is the appointment of one medical man to supervise the pharmacy. Our service requires the knowledge of men who represent or are thoroughly conversant with all the main services of the hospital and are men of the type and standing who can carry back decisions to staff members and have these decisions respected. These committee members can also call upon staff and visiting members for information upon and support for projects being considered by the committee. It might not be amiss for this committee to have a voice in the approval of the qualifications of the pharmacist. We, as a committee do not issue orders, but rather we work on the policy of "ask the man who uses it" and then when our report goes to the administration for an executive order it is often merely a matter of form. This is particularly and peculiarly true of professional supplies. In this field to which little systematized study has been given such a committee will work wonders in terms of both satisfaction and economy

(b) Supervision by the Committee of all purchase and issuance of pharmaceutical and professional supplies items does not mean the act of purchase. This may be left to a clerk or administrative officer but the committee through its pharmacist, should be clothed with authority not only for obtaining proper items but also for rejecting improper ones. All new items should receive committee approval not necessarily for trial but before they become items of stock

#### PRINCIPLE NO 3

An adequate pharmaceutical reference library must be maintained by the hospital

(a) United States Pharmacopœia National Formulary New and Nonofficial Remedies United States Dispensatory reference works on Inorganic, Organic and Quantitative Chemistry Pharmacology Toxicology Bacteriology and a medical dictionary

(b) The *Journal of the American Medical Association* the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION the YEAR BOOK of the AMERICAN PHARMACEUTICAL ASSOCIATION the federal regulations relative to the dispensing

of alcohol and narcotics and a copy of the state and municipal pharmacy laws and sanitary code

Here the attempt has been made to list a bare minimum of reference works. The good pharmacist must be familiar with these reference works and indeed his field of reading must be far wider if he is to furnish adequate service to physicians, nursing service and administration.

#### PRINCIPLE NO 4

Every hospital must use drugs, chemicals and pharmaceutical preparations of at least United States Pharmacopœia, National Formulary and New and Non-official Remedies quality in the treatment of patients.

Comment upon this section should be unnecessary but the inclusion of it is very necessary for the good of the patient. Price is the least important factor in judging the fitness of these things.

#### PRINCIPLE NO 5

The routine preparation of injectible medication and supervision of sterilization of all preparations he himself prepares, the routine manufacture of pharmaceuticals, the dispensing of drugs, chemicals and pharmaceutical preparations, the filling and labeling of all drug containers issued to nursing units from which medication is to be administered, a semi-monthly inspection of all pharmaceutical supplies on nursing units, the maintenance of an approved stock of antidotes in the emergency suite, the dispensing of all narcotic drugs and a perpetual inventory of them, specifications for purchase of all drugs, chemicals and pharmaceutical preparations used in the treatment of patients, specifications for purchase and storage of biologicals and all operations wherein a special knowledge of pharmacy, including a ready knowledge of weights and measures in all systems, is necessary, must be done by the pharmacist or under his immediate supervision.

In commenting upon this principle we shall divide it into its several topics.

(a) Preparation of injectible medication and its subsequent sterilization. This is a true function of the pharmacy and of the pharmacist. This work is now in the hands of cheap labor technicians, nurses, pharmacists and physicians. Sterilization in hospitals is being given careful study in many places now. Nothing has been definitely settled nor have definite standards been worked out, though much has been accomplished. The whole subject is of such vast importance that we firmly believe it should be under the supervision of one person who is particularly fitted to understand its ramifications and who is scientifically trained so that he knows what he is doing and for whom it is a major duty and responsibility and not an incidental one.

(b) The routine manufacture of pharmaceuticals.

(c) The dispensing of drugs, chemicals and pharmaceutical preparations.

(d) The filling and labeling of all drug containers from which medication is to be administered.

(b), (c) and (d) certainly go to the pharmacist without question yet there are many questions upon these subjects which come up regularly for committee judgment. In this connection let us point out the dangers involved in nurse and lay dispensing of drugs to personnel and to patients upon their discharge from the hospital. An entire chapter could be written upon these dangerous practices.

(e) Inspection of drug supplies on nursing units is not alone a check upon the nurse. That phase of it is a small part of the importance of the inspection. Our nursing service welcomes this inspection and the placing of the responsibility for drugs upon the pharmacist where it belongs, and even sends a nursing instructor along with the pharmacist upon these inspection trips.

The following items of this principle are so self evident that prolonged discussion of them seems unnecessary.

#### PRINCIPLE NO 6

This has been left blank for a perfectly self evident purpose, that is, inability at present to state it in definite, clear and concise language though we believe it

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## THE CONFERENCE OF PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS

### MINUTES OF THE CONFERENCE OF PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS

Multnomah Hotel Portland, Oregon

August 8, 1935

The Seventh Annual Meeting of the Conference of Pharmaceutical Law Enforcement Officials was convened by Chairman R L Swain, at 9 30 A M in the Club Room, with the following present

A L I Winne	Virginia	F V McCullough	Indiana
L L Walton	Pennsylvania	F L Christenson	Idaho
C L O Connell	Pennsylvania	John Culley	California
Roy Cook	W Virginia	W M Fulton	California
G L Hayman	W Virginia	F E Mortensen	California
C T Gilbert	Connecticut	Edna E Gleason	California
R C Schultz	Wyoming	W B Rutherford	California
E F Hart	Washington	Roy S Warnack	California
P H Brady	Washington	Arthur Baker	Colorado
R L Parrish	Oregon	W J Bishop	Colorado
Alfred Wiehmark	Oregon	E J Prochaskz	Minnesota
A F Peterson	Montana	R L Swain	Maryland
Hugo Schaefer	New York	F H King	Ohio
Fred Schaefer	New York	M N Ford	Ohio
R S Lehman	New York		

Chairman Swain had no prepared address, however, he reviewed the work of the Conference in the past, in detail Chairman Swain then called upon the Secretary and Treasurer, for his report

#### REPORT OF SECRETARY AND TREASURER

On June 26, 1934 we sent out 300 copies by first class mail, of reprints of the 1933 meeting of the Conference

Since the last annual meeting of the Conference, the Secretary, on September 7, 1934, distributed by first class mail, 315 copies of a compilation by Chairman Swain on the subject of "Temporary Absence "

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At the end of our last annual meeting, we had on hand \$280 67 with no outstanding bills following our last annual meeting, Chairman F C A Schaefer and his finance committee made another appeal for finances from state boards and individual members interested in the Conference From that appeal he secured \$99 00 as follows

John Seiden, Montana	\$2 00	V C Prakowski Michigan	3 00
H A Stype, Ohio	1 00	C H Ganger, New York	2 00
Colorado Board	5 00	F S Houch New York	3 00
H R Rudy, Maryland	1 00	J Leon Lascoff, New York	2 00
Leon Marr, Maine	2 00	Geo C Dieckman New York	2 00



will be easy to make a brief statement that will serve as a basis for future elaboration. This principle should cover the ethical and commercial aspect of the pharmacy" and the things it should deal in, other than those mentioned and hinted at in the first five principles. It should decide who may purchase from the pharmacy, upon what basis and what charges are to be made.

In drafting this principle the whole question of employee purchases, staff purchases and direct sales to the public must come up for consideration. We believe that if we could have the benefit of your discussion upon this very troublesome list of subjects we could at least outline something that would serve as a beginning. May we venture to assert that we believe you all will be opposed to direct sales to the public by a hospital pharmacy. If you agree on this point then the others may be tentatively settled by requiring a set and stated policy by each hospital so that an inspecting officer may see clearly what is being done and judge for himself whether it constitutes ethical practice. This will result finally in the setting forth of a sound Principle No 6 under which all can work.

Before closing we wish to add what we in the University Hospitals of Cleveland call our Drug Policy. We soon learned that our committee could not function properly without such a policy and it may serve a useful purpose to each of you.

#### DRUG POLICY

##### *Pharmacopœia*

The pharmacy shall stock, or be prepared to supply preparations of the United States Pharmacopœia, National Formulary and New and Nonofficial Remedies. Where New and Nonofficial Remedies lists several articles "having similar composition or action," a selection of such preparations, chosen by the Pharmacy Committee and approved by the Medical Council shall be carried. This is necessary because of the expense involved in carrying a large stock of infrequently used items. A selection shall also be made where New and Nonofficial Remedies lists identical products of several manufacturers.

Preparations carried by the pharmacy, excluding such sera and expensive preparations as may be determined from time to time by the Administration and Pharmacy Committee shall be included in room charge to patients. The Pharmacy shall procure other drugs or preparations for hospital patients on request of the visiting physician. Such special orders, however, are to be charged to the patient.

The Pharmacy Committee shall provide a book known as 'The Hospital Formulary' and revise it from time to time. It is to be considered as supplementary to the United States Pharmacopœia, National Formulary and New and Nonofficial Remedies. It is to contain those preparations of drugs and chemicals, sizes of tablets, ampuls, suppositories, etc., which are kept by the pharmacy and may be called for under distinctive titles and which are ready to be dispensed either to Out-Patient or Hospital Departments. Its purpose may be said to be one of convenience in ordering and prescribing.

No new drug or preparation is to be carried by the pharmacy until it has been recommended by the Pharmacy Committee and approved by the Medical Council.

#### PROPRIETARY PREPARATIONS NOT IN THE NEW AND NONOFFICIAL REMEDIES OR OF A PARTICULAR MANUFACTURER

Any drug or preparation, not carried by the pharmacy, which is requested by a visiting physician for a private patient will be procured from an outside pharmacy in the amount ordered by the physician and charged to the patient.

#### DRUGS FOR RESEARCH

The above regulations are not intended to hamper the controlled study of any drug or proprietary article. The pharmacy will therefore supply a specified amount of any preparation for a member of the teaching staff after the approval of the head of his service. When this supply is exhausted more will not be supplied, nor will it be added to the pharmacy stock until a report showing its value has been given to the Pharmacy Committee.

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R L Parrish	Oregon	W J Bishop	Colorado
Alfred Wiehmark	Oregon	E J Prochaskz	Minnesota
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F C A Schaefer, New York	3 00	Edith G Schmitz Wisconsin	1 00
Geo Blackalls Connecticut	1 00	H G Reunzel, Wisconsin	1 00
W C Anderson, New York	2 00		

For the present year the Finance Committee sent out another appeal for a ten dollar contribution from each state or whatever amount could be paid and from that appeal Chairman Schaefer received \$111 00 as follows

Ohio	\$10 00	Florida	5 00
Iowa	10 00	Maine	5 00
North Dakota	10 00	Pennsylvania	5 00
Kansas	10 00	Maryland	10 00
New Jersey	10 00	Minnesota	5 00
New York	11 00	Oregon	5 00
Alabama	5 00	Wisconsin	10 00

This makes a total of \$210 00 received since our last annual meeting Balance on hand May 10 1934, \$280 67 making a total of \$490 67 Bills paid since our last annual meeting are as follows

May 22 1934 E G Eberle print ing of proceedings	\$ 50 00
July 3 1934 Dr Hugo Schaefer ex pense for finance com	26 80
Jan 2, 1935 E G Eberle, reprints	23 76
July 20 1935 R L Swain postage and stationery	8 70
Total expenditure	\$109 26
Leaving a total balance to date of	\$381 41

Upon motion of Mr Schaefer seconded by Mr Gilbert the Report of the Secretary Treasurer was approved

#### REPORT OF THE FINANCE COMMITTEE

F C A Schaefer, Chairman of the Finance Committee, reported that subsequent to the last annual meeting the committee had decided to contact Pharmaceutical Law Enforcement Officials and also individuals who might be interested in the Conference for additional finances An appeal went out, from which the Secretary received \$99 00 From this appeal most of the contributions received came from individuals as a personal donation for the reason it could not be paid out of departmental funds

For the present year an appeal was made to each state board and those having to do with law enforcement for a sum of ten dollars and from this appeal the committee received fourteen replies and have promises from others who said their contributions would follow

Respectfully submitted  
F C A SCHAEFER, *Chairman*

Chairman Swain called for the next item on the program which was an address from Harry C Huse Director of Licenses for the State of Washington Mr Huse being absent his paper was presented by P H Brady of the State of Washington which is as follows

You will notice from your program that this paper was to be handled by Harry C Huse Director of the Department of Licenses of the State of Washington However since your pro

gram was prepared the state of Washington has a Board of Pharmacy entirely free from its Department of Licenses to enforce the pharmaceutical laws

'It is very gratifying that at this first conference of the National Association of Boards of Pharmacy here in the Pacific Northwest that we have a board of pharmacy to represent the State of Washington

"This restoration of self government to the pharmacists of this state due to the untiring efforts of the officers and many of the members of the W S P A and the coöperation of Governor Martin and the legislature of 1935 is an exemplification of that outstanding principle that every industry can best regulate its own affairs and solve its own problems And now that we have this measure of autonomy the responsibility for its success or failure rests entirely with the pharmacists of the state

"The Pharmacy Board may be considered as a committee of three selected from the ranks of the registered pharmacists of Washington to supervise the pharmacy laws and regulations of the state

'I would like to present two pictures to you One is the sorry spectacle of this committee of three, with very limited resources, trying to enforce the pharmacy law against the will of the pharmacists of the state The other is a picture of your District Councils adjusting every difficulty possible in a friendly coöperative manner and as a last resort presenting those cases which cannot be so handled to the Pharmacy Board for prosecution As originally drawn up the measure instituting the District Councils provided for a Director of Law enforcement This work may be handled through your director of Fair Trade Practice but if it proves too much of a burden together with other duties a Director of Law Enforcement should be elected to handle the matter

'The pharmacy law is primarily a safeguard for the public In the next place it is a measure of protection not only for law abiding drug store owners but also for Registered Pharmacist employees The State of Washington, along with other states, now demands a four year course of education and preparation for the students in pharmacy There is an implied contract in this to the extent that the State should see to it that unqualified persons are not illegally performing the work of unemployed pharmacists

'The guiding principle of your Board of Pharmacy will be that the practice of pharmacy is reserved for registered pharmacists just as much so as the practice of Medicine or Surgery or Dentistry is reserved for registered physicians, surgeons and dentists A corporation or an individual may invest money in a drug store but this capital investment does not carry with it the privilege of performing those functions which are reserved by law to Registered Pharmacists

And so, in carrying out these principles, your committee of three would ask the District Councils for coöperation in the following matters Pharmacy renewals To check up shop keepers who are offering for sale drug store merchandise and inspecting those shop keepers who are advertising drug departments or use the word 'drug' in any form of advertising We would also ask your assistance in the matter of checking up on vendors selling household remedies and suggest that you seek the coöperation of your local city and county authorities in this matter While it does not come directly under the administration of the Pharmacy Law your Board suggests that you obtain a list of unemployed registered pharmacists in your district and endeavor to work out a relief system to put men to work

'With the limited resources at our command for the next two years it is only through coöperation of this kind that the new pharmacy law can be effective If the next legislature grants us a larger appropriation we will be able to carry on this work through inspectors but even then this can best be accomplished through the agency of the District Councils

'In closing we would say that it is our ambition to place and maintain the profession of pharmacy in the State of Washington on as high a standard as in any state in the Union

"Approximately \$26,000 00 a year into the State Treasury All money must go to the State Treasury Then the State Legislature appropriates the money We have only \$10 000 00 for two years We might ask for a deficiency appropriation—we are going to ask for more money at the next legislature We have our new pharmacy law and one of the points in it is that all shop keepers who use words to make the public think of drug stores must have a registered pharmacist to supervise the work It was simply a matter of collecting taxes without any great effort to enforce the Pharmacy law Physicians of Spokane County would handle the matter very thoroughly themselves and that is what I am trying to get the pharmacists to do '

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Leaving a total balance to date of	\$381 41

Upon motion of Mr Schaefer, seconded by Mr Gilbert the Report of the Secretary Treasurer was approved

#### REPORT OF THE FINANCE COMMITTEE

F C A Schaefer, Chairman of the Finance Committee reported that subsequent to the last annual meeting, the committee had decided to contact Pharmaceutical Law Enforcement Officials and also individuals who might be interested in the Conference for additional finances An appeal went out, from which the Secretary received \$99 00 From this appeal most of the contributions received came from individuals as a personal donation for the reason it could not be paid out of departmental funds

For the present year an appeal was made to each state board and those having to do with law enforcement, for a sum of ten dollars and from this appeal the committee received fourteen replies and have promises from others who said their contributions would follow

Respectfully submitted  
F C A SCHAEFER *Chairman*

Chairman Swain called for the next item on the program which was an address from Harry C Huse Director of Licenses for the State of Washington Mr Huse being absent his paper was presented by P H Brady of the State of Washington which is as follows

' You will notice from your program that this paper was to be handled by Harry C Huse, Director of the Department of Licenses of the State of Washington However since your pro

gram was prepared the state of Washington has a Board of Pharmacy entirely free from its Department of Licenses to enforce the pharmaceutical laws

It is very gratifying that at this first conference of the National Association of Boards of Pharmacy here in the Pacific Northwest that we have a board of pharmacy to represent the State of Washington

"This restoration of self government to the pharmacists of this state due to the untiring efforts of the officers and many of the members of the W S P A and the coöperation of Governor Martin and the legislature of 1935 is an exemplification of that outstanding principle that every industry can best regulate its own affairs and solve its own problems And now that we have this measure of autonomy the responsibility for its success or failure rests entirely with the pharmacists of the state

' The Pharmacy Board may be considered as a committee of three selected from the ranks of the registered pharmacists of Washington to supervise the pharmacy laws and regulations of the state

' I would like to present two pictures to you One is the sorry spectacle of this committee of three, with very limited resources, trying to enforce the pharmacy law against the will of the pharmacists of the state The other is a picture of your District Councils adjusting every difficulty possible in a friendly coöperative manner and as a last resort presenting those cases which cannot be so handled to the Pharmacy Board for prosecution As originally drawn up the measure instituting the District Councils provided for a Director of Law enforcement This work may be handled through your director of Fair Trade Practice but if it proves too much of a burden together with other duties a Director of Law Enforcement should be elected to handle the matter

' The pharmacy law is primarily a safeguard for the public In the next place it is a measure of protection not only for law abiding drug store owners but also for Registered Pharmacist employees The State of Washington along with other states now demands a four-year course of education and preparation for the students in pharmacy There is an implied contract in this to the extent that the State should see to it that unqualified persons are not illegally performing the work of unemployed pharmacists

' The guiding principle of your Board of Pharmacy will be that the practice of pharmacy is reserved for registered pharmacists just as much so as the practice of Medicine or Surgery or Dentistry is reserved for registered physicians, surgeons and dentists A corporation or an individual may invest money in a drug store but this capital investment does not carry with it the privilege of performing those functions which are reserved by law to Registered Pharmacists

' And so, in carrying out these principles, your committee of three would ask the District Councils for coöperation in the following matters Pharmacy renewals To check up shop keepers who are offering for sale drug store merchandise and inspecting those shop keepers who are advertising drug departments or use the word 'drug' in any form of advertising We would also ask your assistance in the matter of checking up on vendors selling household remedies and suggest that you seek the coöperation of your local city and county authorities in this matter While it does not come directly under the administration of the Pharmacy Law your Board suggests that you obtain a list of unemployed registered pharmacists in your district and endeavor to work out a relief system to put men to work

With the limited resources at our command for the next two years it is only through coöperation of this kind that the new pharmacy law can be effective If the next legislature grants us a larger appropriation we will be able to carry on this work through inspectors but even then this can best be accomplished through the agency of the District Councils

"In closing we would say that it is our ambition to place and maintain the profession of pharmacy in the State of Washington on as high a standard as in any state in the Union

' Approximately \$26,000 00 a year into the State Treasury All money must go to the State Treasury Then the State Legislature appropriates the money We have only \$10,000 00 for two years We might ask for a deficiency appropriation—we are going to ask for more money at the next legislature We have our new pharmacy law and one of the points in it is that all shop keepers who use words to make the public think of drug stores must have a registered pharmacist to supervise the work It was simply a matter of collecting taxes without any great effort to enforce the Pharmacy law Physicians of Spokane County would handle the matter very thoroughly themselves and that is what I am trying to get the pharmacists to do "

The paper was discussed by Messrs Cook Swain Rutherford and Fulton

#### DISCUSSION

Mr Cook 'What constitutes a shop keeper?'

Mr Brady 'A grocery store that handles Castoria Mentholatum, etc If they use the word drugs in any way, then they must have a registered pharmacist in attendance'

Mr Cook 'In the state of Washington what is the attitude of the Board of Pharmacy and what can they do about such a situation?'

Mr Brady 'When they have a sign up saying Leave prescriptions here' That can only be done by a registered pharmacist at all times even if he does not fill them—our interpretation is receiving is dispensing There are members of the legislature who are shop-keepers and that is why the fee was reduced from \$6 00 to \$2 00'

Mr Swain "Does the Board have any full time employees to take care of this work?"

Mr Brady Mrs Adams has been turned over to us on a part time basis All our records are at Olympia and she looks after it all The Department of Licenses pays the major part of her salary and we pay the rest'

Mr Swain Is there any member of your Board who is a full time member?"

Mr Brady No We are putting a paid inspector to work on September 16th to inspect and report and if the thing is to be taken care of at once he takes it up to the prosecuting attorney'

Mr Swain What license do the itinerant vendors pay?"

Mr Brady Two dollars per year'

Mr Swain How many?

Mr Brady They are working on that now and it's very difficult to find out In the past, these companies have been very willing to cooperate The first step is to write to them and get the names of their individual agents Twenty such fees have been paid'

Question What do these vendors sell?

Mr Brady Household liniments and veterinary remedies'

Mr Swain Do you enforce the law that department stores cannot use the words patent medicines?

Mr Brady They could not without using a registered pharmacist They usually employ registered pharmacists—girls'

Mr Rutherford Does your Board register Asiatics?"

Mr Brady They have to be citizens of the United States—foreign born is all right as long as they are naturalized citizens'

Mr Fulton It might be of interest to know that we have pharmacists assistant pharmacists general dealers itinerant vendors We have general dealer licenses if they are 3 miles from a drug store—they can sell any medicine that is trade marked and registered We give them a list of what they can sell Our itinerant vendor license is \$100 00 a year Nobody can run a prescription drug store unless he has a pharmacist in charge from the time he turns the key until he shuts the door No exceptions of any kind No one can use the word drugs unless he is a registered pharmacist They have no agents any more, or dealers Ford did have Ford dealers Now he has agents They buy the stuff and then they have no further responsibility We have seven inspectors and four of them will work wholly on itinerant vendors and general dealers Last week we had one fellow get five itinerant vendors and about twenty general dealers We catch more druggists violating the poison law than others We have a lot of first-class druggists in California and some that don't want to live up to the law We gave one of these in San Francisco seven prescriptions and on five of them he substituted They are hurting the business and not helping anybody else'

At this time Chairman Swain appointed a nominating committee consisting of C T Gilbert, *Chairman*, Fred Schaefer and F V McCullough with instructions to bring in nominations for a *Chairman* *Secretary* and *Treasurer* and *Delegate* to the House of Delegates

Frank L Christenson, President of the Idaho Board of Pharmacy explains the Idaho laws as follows

It might be said that I have been interested in this work for several years I have studied the laws of every state even the Dominion of Canada very seriously with the help of some good

legal authorities I have obtained practically every decision rendered for the past 15 years I want to make a statement that we have a very unsatisfactory set-up in Idaho I am attempting to operate a 'bluffer' act So long as I am on friendly terms with the state police and the government I am getting by very nicely We have no money to enforce, just as Mr Brady said, 'all of our funds at the present time have to go into the State treasury and it takes an appropriation to get them back out' For your information I am one of those trying to raise about two million dollars in this state for relief, and I think one of the best ways would be to put a tax upon peddlers and agents of about \$500 00 or more As Mr Mortensen said, when they start to tear your bill apart, place another before them and get them to fight and you will generally get a compromise 'Until 1937 we will be operating under what is commonly termed the 'bluffers' act''

Mr A L I Winne, of Virginia, talks on the subject of the difference between patent and proprietary medicines, as follows

"Relative to the difference between patent and proprietary medicines

The committee has done nothing since the time it rendered a report At that time we did get the information from all over the United States and found it deplorably deficient, as a matter of fact I believe my own state is the only one that has a definition and it is a very poor definition Some of the states have what might be constituted as a casual definition but nowhere in the United States could I find a clean cut definition We talk about patent medicines We talk about proprietary medicines In the eyes of the law a patent medicine is a proprietary medicine It says the nature of the remedy must be on the label address must be on the label directions for its use must be on the label I have found that useful sometimes when you go in and find some remedy that does not have a label which states for what it is intended to be used We just tell them to throw it out That is the bluffer' law This subject has got to be studied further and I think good legal talent will have to be employed to get a definition that will hold water I think that in most states patent medicines are going to be sold in general stores Most states have legislatures very much like that in Idaho I think that is the most difficult thing we have to face—how to put a good definition over and still not encounter the opposition of the people who are sympathetic with the dealers in the stores out in the country There is no drug store there—people need the medicine They have to find somebody to sell the medicine" Mr Cook made a motion seconded by Mr Gilbert that Mr Winne's committee on definition of 'Patent and Proprietary Medicines' be continued —Motion carried

#### DISCUSSION

Fred Schaefer 'In New York we have never had any difficulty with that We have handled them as a class'

Mr Christenson, Idaho 'We are not attempting to differentiate between those two terms but we are attempting to segregate advertised package remedies and pharmaceutical preparations Those who own a process patent and have a copyrighted label have the exclusive right to the finished product and still it's proprietary'

Mr Schaefer 'Why can't the law simply read patent or proprietary medicine and include both?'

Mr Christenson, Idaho 'There are two types of patent and proprietary medicines We handle those all as one'

Mr Winne 'You can't draw a distinction between patent and proprietary medicine What we call patent medicines are not patent medicines at all We have to draw a line of demarcation between those that are intended for self-medication and those intended for use of physicians Just as soon as we attempt to draw up a definition which will segregate those things they will throw them out into the other class We have to draw up a definition and draw it up good and tight so it will not matter how they change their labels'

The subject was further discussed by Messrs Culley, Hugo Schaefer, Christenson Swain Fulton Rutherford, Winne and Cook Upon motion by Mr Cook, seconded by Mr Gilbert, the Winne committee on the definition of patent and proprietary medicines was ordered continued

Mrs Edna Gleason of California discussed legislation effecting the control of pharmacies pharmacists and the manufacture and distribution of drugs and medicines, as follows

'I am naturally very interested to know what the other Boards of Pharmacy were doing



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"I am naturally very interested to know what the other Boards of Pharmacy were doing

but I think that maybe California (I don't want to say takes the lead) but I think that we are just a jump ahead of other states I want to say perhaps it is because we have seven members on our Board of Pharmacy and maybe we have sold the idea to the people of California as well as to the legislature that we are looking out for the public health and safety of the people

'The Board of Pharmacy has the right to make rulings not inconsistent with the laws of California Dinitro phenol can be sold by no one except by a registered pharmacist and that is on a prescription and only can be refilled by a doctor's orders Many of you have been reading the journals recently of the results of thyroid We feel that making a move like that is the first step toward real cooperation in bringing back a closer relationship of the doctor and the druggist—when we will refrain from selling anything of which we don't know the contents

We have \$94 000 00 and we can't begin to do the things that we feel should be done to carry on our work successfully and be a credit to the state We are trying to do it but we can't do it without finances We started this year to put over a bill in the legislature We find that what is good for one should be good for them all We find that the little druggist who wants the other fellow to behave, doesn't want to behave himself We are going to help police the industry and then our enforcement is going to be a very minor affair The little fellow knows what's good for the other fellow, but he doesn't want to take the same medicine himself

You can get anything that you believe in They said we couldn't do anything against chain stores All the money in the world can't combat man power We proved it You can have whatever legislation you want if you go there with a firm purpose If your policy is right and you are looking out for your community or the people, at large, you will be heard—if you are willing to abide by the law and say this is going to pinch me a little bit but it's good for the other fellows' If you believe in what you are doing and you know you're right you have to convince the other fellows We criticise the man that makes more laws Why do we want more laws when we have laws now that are never obeyed?

Edna Gleason 'Our college requirements are 3200 hours only one examination to be given to a student immediately upon his graduation and he is given a certificate and as soon as he has proven his year's experience he can come back and is then given his diploma He does not have to take two examinations as he has in the past He must have that examination during his college He has his experience year after he takes the examination to get his certificate and if he doesn't make 75 he cannot get his certificate "

*Question* What about your reciprocity?"

Edna Gleason In order to protect our men we have had to refrain from any reciprocity We have had an overflow of as high as 3000 or 4000 unemployed druggists We had to protect our men and keep the other fellows from coming in People are willing to work for \$18 00 and \$20 00 a week because there has been that influx of people coming into the state '

**Dr Hugo Schaefer**, of New York, took the place on the program of Mr Geo Mather and explained provisions of the Dunkel Bill in their state as follows

I will restrict my talk to the Dunkel Bill Several years ago when we were working under our old law the Board of Pharmacy was in control of all medicines with exception of proprietary or patent medicines this left a large loop-hole Two years ago we passed the Dunkel Bill, this placed under the control of the Board of Pharmacy the sale of all proprietary medicines which were harmful or habit-forming During last winter the Board of Pharmacy drew up the regulations for the sale of these preparations which were put under their control—regulation which governs the sale—that these preparations, patent or proprietary which are habit-forming or deleterious can only be sold by registered pharmacists—to have a measure of safety in a drug store which we would not have in a grocery store If a man is working one day in a grocery store and he sells a preparation illegally and if he is working for a druggist it is legal—does not seem quite right Therefore the sale must be made by a registered pharmacist The grocer couldn't very well say whether the patent medicine contains a harmful or habit forming substance and they therefore last year passed a labeling law which requires that every patent medicine or proprietary medicine if it contains any of these ingredients that it must have that ingredient on the label put on by the manufacturer, with the quantity thereof The manufacturer's name and address must be on the label and the preparation must be manufactured under the supervision of a pharmacist or chemist Our law defines anything as a poison which may cause death to the

human adult life in a 60 grain dose—that preparation can in future only be sold in registered pharmacies by registered pharmacists ”

Mr Gilbert Does the New York law define what a chemist is?”

Dr Schaefer We left the law that way because we were afraid to make it simply a pharmacist—there are certain lines where a chemist would be just as much in order We put in the word ‘chemist’ even though we have no definition for a chemist at the present time The Board took it up at its last meeting Don’t know whether it was finally accepted or not ”

Dr Schaefer’s remarks were discussed by Messrs Culley, Swain, Gilbert, Walton and Winne

Mr R C Schultz, of Wyoming, makes a report of conditions in his state, as follows

There was no legislature enacted at the last session of the Wyoming legislature However the Board of Pharmacy on April 8th of this year had a conference with the Attorney-General of the State of Wyoming for the purpose of examining the laws that we had to see if something in the nature of enforcement could be had simply by interpretations A two day conference was held with the Attorney-General There was much interest in the discussion on patent and proprietary medicines because we find that the Rocky Mountain states have about the same law on patent and proprietary medicines The Board of Pharmacy of Wyoming will endeavor to enforce them and of course there are differences in the law in different states and the only thing the Board of Pharmacy can do is to apply them to their own particular state Wyoming does not have a license fee for drug stores

QUOTE RULES AND REGULATIONS OF THE WYOMING COMMISSION OF PHARMACY, adopted April 8, 1935 Page 14 of the Pharmacy Laws of the State of Wyoming, together with the Rules and Regulations of the Commission of Pharmacy

Wyoming is called the state of the great wide open spaces We only have 122 drug stores in the entire state and inspection is made once a year Naturally the funds of the state are not very extensive possibly as low as any state in the Union although we were able a few years ago to get the Board of Pharmacy on a self sustaining basis Money does not go into a general fund at all—in the hands of the State Treasurer—but paid out only on the order of the Board of Pharmacy ”

Mr A F Peterson, of Montana, reports as follows

‘At the last session of the legislature in Montana they spent most of their efforts killing the legislation that would be hard on the drug business A contraceptive act was passed which limits the sale of all contraceptives to a drug store Merely possession of a stock by anyone outside of a drug store is a violation An inspector discovering it confiscates it The legislature passed a poison register law which requires druggists to make out an affidavit each time a poison is sold and gives the Board of Pharmacy the power to designate what is a poison In Montana we have just inaugurated our first law enforcing campaign The state is so large and the expense so great, it is impossible to raise the money When drugs are sold in a drug store they are regulated by the State Board of Pharmacy but if they are sold any place else they are not regulated so the inspector had a very fertile field to work in After being on the road for two months, only a small part of the state was covered He has not lost a single case—every violator that he has cited in court with one exception was cited for selling aspirin I do not think there is any chance of losing that case Our enforcing campaign has only been operating for two months—we have noticed a lot of improvement The principal violators are the grocery stores, some of the wholesale grocers have put in lines of drugs ”

Mr John Culley makes a report for the State of Nevada, as follows

‘Nevada is instituting a campaign for bringing everybody up to registration requirements There are only 48 drug stores and five of those are owned by two people so there are really only 44 proprietors in the state of Nevada There is only one registered assistant in Nevada and he is going to take the examination next Fall ”

Roy Cook, of West Virginia, gives the following report for his State

It seems to me that if some way could be set up by which we could sit down and exchange our copies of laws forms blanks of all kinds, from one state to the other it would be very helpful I have been interested in our young friend in the house of delegates in Idaho He has my sympathy I would suggest that if he could enable us to control Senator Borah that that would be helpful In West Virginia last year we have had some changes in connection with the alcohol and liquor situation Out of 425 stores 212 carry beverage sale permits Those that traffic from one state to another always have something that cannot be tolerated—they attempted to compel the pharmacist to buy alcohol from or through but mostly from these various beverage control commissions It had to be purchased from the commission and a charge of \$10 00 was made regardless of whether liquor was sold or not The state added to that a profit Ten dollars was paid for a permit, \$7 25 for a can of alcohol and 50 cents for having it delivered Then it was announced that a pharmacist could buy alcohol from the liquor stores and would not have to pay the \$10 00 license fee Some did this and were hauled up on the grounds that it made them manufacturers

Just before I left the city of Charleston, by inviting the Attorney General out to two or three dinners he decided that he could find a loop hole in this One of the very best things we have done in West Virginia is to borrow from Virginia a few changes and get a new permit law It creates confidence

Upon motion, duly seconded the Conference adjourned at 12 45 P M to meet in joint session at 8 00 P M

The Conference convened at 9 00 P M August 8th in the Junior Ball Room of Hotel Multnomah, in joint session with the Section on Education and Legislation and the Conference of Pharmaceutical Secretaries

The Joint Session was called to order by Chairman McCullough of the Secretaries and the record of this meeting will be printed elsewhere<sup>1</sup>

The Second Section of the Conference of Pharmaceutical Law Enforcement Officials was called to order by Chairman Swain at 9 50 A M in the Junior Ball Room August 9 1935 The following were present

P H Brody	Washington	S L Hilton	Dist of Columbia
Roy Cook	W Virginia	C T Gilbert	Connecticut
G L Hayman	W Virginia	F L Christenson	Idaho
R P Fischelis	New Jersey	R A Lyman	Nebraska
L L Walton	Pennsylvania	Zada Cooper	Iowa
E F Cook	Pennsylvania	W J Tecters	Iowa
W B Day	Illinois	C E Mollett	Montana
Edna Gleason	California	R L Swain	Maryland
Fred Schaefer	New York	F H King	Ohio
Hugo Schaefer	New York	M N Ford	Ohio

Chairman Swain referred to the program and asked that the first number under item seven be discussed This subject was discussed by the Chairman, also Fred Schaefer Hugo Schaefer, Mrs Gleason Mr Brody, Mr Cook and Mr Day

At this point the Chairman stopped the discussion and proceeded to the next question Should Boards of Pharmacy be empowered to regulate the number of drug stores and if so what shall be the basis of such regulation? Discussion was general and many good points were brought out

The question "What can be done to further restrict to pharmacists the distribution of potent drugs and medicines and medicines in general" came up This subject was continued at this time without discussion

The next question "Have the barbituric acid laws worked out satisfactorily" was discussed The general impression was that longer experience was needed to answer this question

The next question to be discussed was "Should Law Enforcement Officials attempt some program looking to supervised experience?" This subject was ordered continued for the next year

<sup>1</sup> February JOURNAL

The subject to come up next for discussion was 'What enforcement difficulties have been met with under the Uniform State Narcotic Act?' This subject was held over

At this time the Chairman referred to the Finance Committee and upon motion by Mr Gilbert seconded by Mr King the Finance Committee was ordered continued

The Chairman next referred to the advisability of sending out reprints of this meeting Upon motion by Mr Fred Schaefer, seconded by Mr Gilbert, reprints of the meeting were ordered distributed to members and others interested

Upon motion by Mr Hugo Schaefer, duly seconded, the remainder of the program was ordered postponed

At this time the Chairman asked for the report of the Nominating Committee Chairman Gilbert of the Nominating Committee made the following report

For *Chairman*, R L Swain, Maryland

For *Secretary Treasurer*, M N Ford, Ohio

For *Delegate to House of Delegates* Fred Schaefer, New York

Your committee recommends the same officers be continued for the ensuing year

Upon motion by Mr Cook, seconded by Mr King, the report of the Nominating Committee was received and the same officers continued for the ensuing year

Chairman Swain then referred to the difficulty in getting attendance for the meetings and asked the advisability of holding the first meeting next year on a Sunday Evening or Sunday Night previous to the opening of the Convention

Upon motion duly seconded, the Chairman was empowered to arrange the program for next year as he may deem advisable

Upon motion duly seconded, the Conference adjourned at 12 15 P M

M N FORD, *Secretary Treasurer*

NOTE It was necessary to defer the Abstracts of the Minutes of the Conference of Pharmaceutical Association Secretaries to the February JOURNAL

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## THE TEXAS CENTENNIAL

The Texas Centennial will be different, while the central celebration will be in Dallas where the gigantic construction program is now bringing into being the buildings that will house the Texas Centennial Exposition, many other cities and all sections of the State will prepare for special celebrations San Antonio will be the scene of a beautiful commemoration at the Alamo, Houston will hold an impressive San Jacinto exposition, Tyler will have its Rose Festival on a more beautiful and larger scale and Corpus Christi a water pageant—these are only a few of the many other colorful celebrations which will dot the State throughout the Centennial Year

## THE CITY OF MEXICO

The interesting city of Mexico was founded by the Aztecs about 1325 Aztec writing recently, was brought to the attention of pharmacists by the rediscovery of the Badianus Manuscript<sup>1</sup> The City is situated about 7400 feet above sea-level, Popocatepetl is about 40 miles to the southeast its peak is 17 550 feet, and its crater about 2000 feet wide

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## SALT LAKE CITY MAY ESTABLISH A CLERK SCHOOL

Salt Lake City druggists contemplate the organization of a local association and they are considering the suggestion of the American Vocational Association to establish a training school for clerks D R Gardeman has been giving lectures on the subject

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<sup>1</sup> See September JOURNAL, page 771

# ABSTRACTS OF THE MINUTES OF THE SECTIONS, AMERICAN PHARMACEUTICAL ASSOCIATION

*(Continued from page 1021 November Journal)*

## SECTION ON COMMERCIAL INTERESTS

Additions and corrections of the abstracts invited

The First Session of the Section on Commercial Interests was called to order by Chairman Henry Brown on August 7th at 2 00 P M He welcomed those in attendance and then presented his address it follows

### ADDRESS OF THE CHAIRMAN

BY HENRY BROWN

The Section on Commercial Interests has rapidly taken an important part of the sessions of the AMERICAN PHARMACEUTICAL ASSOCIATION conventions the papers presented are typical of the various phases of American pharmacy This year I am happy to state we have excelled in our program, although a few of our eastern authors are unable to attend, we have been fortunate in having a number of papers, to be presented by our western members, who have been very generous with their time and efforts

The Chairman is extremely grateful to the various contributors and hopes the discussions will be to the point and as brief as possible due to our lengthy program

May I thank this large group for their interest in our Section I feel that they will be amply repaid for their attendance

The report was accepted

The report of Secretary R T Lahey was read by Vice Chairman Robert W Rodman owing to the absence of the former

### REPORT OF THE SECRETARY

BY R T LAHEY

We sent out on official stationery of the Section on Commercial Interests 139 letters asking for contributions of papers to individuals who we thought might be interested in the work of our Section We secured 17 acceptances one of which was a paper dealing more with the education of pharmacy students and this paper was turned over to and accepted by the Committee on Education and Legislation

I want to thank our members on the West Coast for the fine cooperation received from them I was especially desirous to get as many papers as possible from this section so that the visitors from the other parts of the country might hear from them as they are seldom in attendance at our meetings that are held in the East Also my thanks are extended to Chairman Brown Vice Chairman Rodman John A J Funk and Deans Mickelsen and Ziefle for advice and help

'I trust that the program will prove interesting and I keenly regret my unavoidable absence The expenses incurred amounted to \$5 11 for postage'

The report was accepted

The first paper called for was, 'What Determines Net Profit' —Not submitted

The next paper 'The Pharmacist Studies Law' was read by Charles G Ajax (Printed in the October JOURNAL pages 863-865)

'Merchandising Your Profession' by Ralph A Beegle was submitted (No discussion)

'The California Fair Trade Act' by Ira Darling was presented and discussed (It is printed in the November JOURNAL, pages 981-987)

'The Place of Commercial Subjects in the Pharmacy Curriculum' by Neal B Brown was submitted (It is printed in the November JOURNAL pages 987-990 no discussion)

'How to Help the Pharmacist Commercially' by E C Brokmeyer is published in the October JOURNAL pages 861-865 —No discussion

Titles of the following papers were read but no papers submitted The Fair Trade Acts

and Their Effects " by Paul C Olsen 'Dogs, Cats, Birds, and Babies ' by Alice-Esther Garvin — Not submitted

"Prescription Pricing" by Frank A Delgado was submitted No discussion

## SECOND SESSION

The Second Session of the Section on Commercial Interests was called to order by Chairman Henry Brown, August 8th, at 9 00 A M

Reading of papers was continued 'Local Biological Sale Survey' by Clarence M Brown —To be submitted

Discussion of the Lilly Digests," by J F McCloskey —To be submitted

The Futility of Cutting Prices and a Comparative Price Survey of Two States," by George M Archambault —Read by Henry F Hein (No discussion)

'The Visible Prescription Department," by George W Fiero —Printed in the November JOURNAL, pages 973-974 (No discussion)

"A Course in the Study of Drug Store Sundries " by Haakon Bang

'A Scientific Study of the Merchandising Value of Windows," by F A Geue —Read but not submitted

The Committee on Nominations submitted a report, presenting the following nominees *Chairman*, R W Rodman New York, *Vice Chairman* R T Lakey, Detroit *Secretary*, H F Hein San Antonio Tex, *Delegate to the House of Delegates* Henry Brown, Pennsylvania On motion duly seconded and a vote the nominees were duly elected and installed, the Section was then adjourned

NOTE The Abstracts of the Minutes of the Sections will be concluded in the February JOURNAL

## RESEARCH GRANTS

Recipients of grants from the Committee on Scientific Research of the American Medical Association include Dr Frank R Menne professor of pathology at the University of Oregon Medical School, for a study of cholesteremia in rabbits, Dr Lloyd H Ziegler and Dr Arthur Knudson of the Albany Medical College Albany N Y, for completion of their work on activity after recovery from rickets and F A and E L Gibbs toward the completion of a study of the regions in the cat's brain which have an especially low convulsion threshold The work is to be done in the department of physiology of the Harvard Medical School

## TESTIMONIAL DINNER

A testimonial dinner was tendered Thomas S Smith, *Chairman* of the N A R D Executive Committee November 7th, at Hotel Du pont Wilmington Del Pharmacists were present from Connecticut, District of Columbia, Delaware, Maryland, Pennsylvania other states and friends not engaged in pharmacy Walter Morgan, of Wilmington, presided and was pronounced an ideal toastmaster The guest of honor was presented with a porch rocking chair and a handsome traveling bag The evening was a most delightful one and the speeches brief and happy

## FEEES OF BOARD OF PHARMACY IN TEXAS

It was held by the Civil Court of Appeals, Texas, that fees collected by the State Board of Pharmacy cannot be turned over to the Texas Pharmaceutical Association and the clause of the law providing for it is unconstitutional and void The Court affirmed the case of the Association against C B Allison and others, members of the Texas State Board of Pharmacy

Section 140 of Chapter 107 acts of the Forty-First Legislature provides that the Association should be given up to \$2 00 of each \$3 00 annual renewal fee of active registered pharmacists and \$1 00 of the \$2 00 assessed against inactive pharmacists In 1933 the board collected \$14 942 00 of such fees and after paying its expenses had \$9553 00 remaining which the Association sued to recover It was held by the trial court and sustained by the appellate court that the provision making such allocation is void as violative of Section 51 Article 3, of the Constitution, on the ground that it is public money and cannot be diverted to a private purpose or to a private corporation All other provisions of the act are upheld, specific mention being made of the validity of the sections imposing the annual renewal fees



# EDITORIAL NOTES

## A CORRECTION

It is regretted that an inadvertent error on page 1049, December JOURNAL was permitted to pass. Please correct— January 1 1920 ' to read January 1, 1820 "

## PHARMACISTS IN PUBLIC HEALTH SERVICE ADVANCED

The following Assistant Pharmacists in the Public Health Service have been advanced to the rank of Passed Assistant Pharmacist to take effect as such from September 5 1935 Raymond D Kinsey, Walter H Keen Clarence H Bierman and Thomas C Armstrong

## HARTMAN'S SOLUTION

Thymol  $1\frac{1}{4}$  parts by weight  
Ethyl alcohol 1 part by weight  
Sulphuric ether 2 parts by weight

Keep tightly corked in a brown glass bottle. Use cork or tin lined stoppers only. The application is made on a pellet of cotton, directly to the dentin or caries. Use rubber dam.

The formula of this desensitizer was given first-page notice in the *New York Times* of January 22nd and the discovery is credited to Dr LeRoy L Hartman professor of Dentistry in the Columbia School of Dentistry and Oral Surgery. The formula was given out at a special joint meeting of the First and Second District Dental Society of New York following a dinner in Dr Hartman's honor who, in responding said that this is his humble contribution to humanity as he hopes it will be the means of relieving much unnecessary suffering.

It was stated by a dentist to rank with the discovery of the anesthetic properties of nitrous oxide in 1844 by Dr Horace Wells. A basic patent was obtained by Columbia University but it was decided by Dr Hartman and the Columbia University authorities not to take the patent up but give it free to the world. It seems that the value of the formula is not only in the constituents but also in the method of compounding the solvent. Dr Hartman cautioned that its use by the public as a self-remedy against toothache may result in more harm than good. The preparation must be applied directly to the dentin as it does not penetrate the enamel. It is stated to be effective for

twenty minutes to an hour during which time virtually any cavity may be prepared for filling.

Since the foregoing announcement Dr Paul Jesserich of the University of Michigan has questioned the outstanding value of the discovery.

## CASCARA SAGRADA AN UNUSUAL ADULTERANT

BY H W BLAIR, M P S

This note refers to an incident occurring in ordinary experience. The adulterant has neither medical properties nor any faint resemblance to cascara sagrada. The purchase of a drug like cascara is done by sample, quotation and specification and the consignment in question was guaranteed to be a very fine specimen of five-year-old bark. The sampling and examination of the bulk brought to light a very curious stupid and obvious adulteration. Intermixed with the bales were found large smooth stones and inside each package a bag containing chips of a species of wood entirely foreign to cascara. The wood proved to consist wholly of portions of the wood of *Pseudotsuga Douglasii* the false Douglas fir which is one of the native conifers of the Pacific coast of America, from which region cascara comes. The brokers a firm of high reputation on being communicated with replied that it was obviously a case of deliberate adulteration, all the more curious because deliveries had been made to several purchasers from the same ship load, and none of these had made any complaint. Correspondence with the shippers who had the entire confidence of the brokers led to the conclusion that the adulteration was the work of some native worker desirous of making up his daily tally, and it was added that every thing possible would be done to prevent "tee lers" adulterating the bark in this way in future. The adulteration formed about 2 to 5 per cent of the entire bulk of the consignment but of course, in various packages the percentage was considerably higher.

(A communication to the Edinburgh Evening Meeting in the *Pharmaceutical Journal*, December 21st.)

## PROTAMINE INSULINATE

Protamine insulinate (insulin retard) opens the door for fresh studies in the treatment of diabetes. With it the blood sugar can be kept

more nearly normal and any advantages that can occur from this fact ought to show within a few years. Already it is known that the diabetic patient who is carefully treated is the one who lives longest and is most free from complications. Can the diabetic patient with blood sugar controlled throughout the twenty-four hours do better still? The new insulin in its present form demands more intelligence in its use, it works too slowly for coma and too slowly to overcome the hyperglycemia of a large meal, and it has the disadvantage of not being stable for more than a few weeks. When properly employed it will replace the customary high fasting blood sugar of the diabetic patient with a normal blood sugar. Perhaps the wise patient with diabetes will employ the quickly acting old insulin in the morning with a heavy breakfast and the slowly acting new insulin at night before a light dinner, as Dr Hagedorn's patients have done.

"Thus undoubtedly represents an important advance in the treatment of diabetes, it should be emphasized, however, that protamine insulinate is still a laboratory preparation and is not yet commercially available in this country. The compound must be prepared shortly before use, as it is stable at most for only a few weeks. It does not supplant ordinary insulin but serves as an adjunct to the latter, the two must usually be used in the same patient at different times of the day. Hagedorn and his associates point out that protamine insulinate is of no special value in those patients who are now adequately treated with insulin. But for those patients whose diabetes cannot be controlled satisfactorily with insulin alone, protamine insulinate is a valuable contribution—indeed the most valuable since the original discovery of insulin by the Toronto group"—From *Journal A M A* of January 18th, page 218.

### PRESCRIPTIONS BY PHONE

The *Journal of the American Medical Association* for January 11th reports a case in which damages were assessed against a drug firm. While this case is not altogether based on prescription by telephone the question enters and it brings out the importance of having the signature of the physician and also the assurance of the physician that the prescription is correctly written and understood. An error in prescription practice may result in great financial loss and also reputation, therefore, pharmacists should be guarded in this practice.

### MARIHUANA SMOKING

The use of Marihuana was almost unknown, except in Mexico, adjacent states and a few localities elsewhere, addiction has spread in recent years, necessitating State legislation. Marihuana cigarettes with and without tobacco are used by addicts and the number has increased because the plant has spread by natural propagation.

### PERSONAL AND NEWS ITEMS

Marvin R. Thompson, professor of pharmacology at the University of Maryland, School of Pharmacy, has been named by *Modern Medicine* as one of the 25 men for making medical progress in 1935. Credit is given "for isolating and identifying as an alkaloid the new active oxytocic principle of ergot, independently discovered by Adair, Davis, Rogers, Kharasch and Legault, also by the English investigators, Moir and Dudley."

Dr Francisco Cignoli, member of the AMERICAN PHARMACEUTICAL ASSOCIATION in Buenos Aires has published a report of the Twelfth International Pharmaceutical Congress recently held in Brussels. A report was published in the December *JOURNAL*, pages 1113-1119.

Lars Christianson, for forty eight years a Fargo druggist, was honored on the eve of his eightieth birthday by a group of Fargo friends and business associates. Mr Christianson throughout his fifty four years of residence in Fargo, has been active in civic affairs. He is one of the founders of St. Luke's Hospital, a founder of the First Lutheran Church, and for forty-four years he has been secretary of Concordia College, Moorhead, Minnesota. Mr Christianson came to the United States from Norway in 1873.

Alden H. Emery, assistant chief engineer of the Experiment Stations Division United States Bureau of Mines has been appointed assistant manager of the American Chemical Society, a newly created office. Mr Emery, who is 34 years old, is a native of Lancaster, N. H. He is a graduate of Oberlin College and Ohio State University, and is now secretary of the society's gas and fuel division. Dr Charles L. Parsons, of Washington, and R. T. Baldwin, of New York have been reelected secretary business manager and treasurer, respectively.

## LUCIUS LEEDOM WALTON

## AN APPRECIATION

In the passing of Lucius L. Walton after a busy and fruitful life of seventy years, American Pharmacy loses one of its noblemen. Courteous and friendly colleague of two generations of pharmacists, able examiner of thousands of candidates who have applied for registration as pharmacists in the Keystone State in the past 30 years, even-tempered and diligent worker in the committees, conferences and organizations of his beloved profession and in his church, polished fair, inspiring and extraordinarily capable presiding officer in the Pennsylvania Pharmaceutical Association, the National Association of Boards of Pharmacy and the AMERICAN PHARMACEUTICAL ASSOCIATION, efficient secretary and later president of the Pennsylvania Board of Pharmacy and leader in many activities within and outside of the profession which he graced—such is the memory, at least in part, which Dr. Walton leaves with those who knew him best.

To have known him intimately and to have come under the spell of his fine personality, his lofty idealism and his passion for service to pharmacy was in itself an education. His efforts to meet the problems created by the dual aspect of the drug industry in a day when cynicism toward the professional ideals of pharmacy was on the increase were always inspiring.

In his Presidential Address to the AMERICAN PHARMACEUTICAL ASSOCIATION in 1926 he referred to the qualifications of members of Boards of Pharmacy in the following words:

The persons who sit in judgment on the qualifications of those seeking admission to the profession of pharmacy and administer the pharmacy laws, should be trustworthy and well qualified technically. They ought also, to be free from all political, social or friendly interest. There is no duty which may fall to the lot of a pharmacist that requires such broad knowledge, careful discrimination, good judgment, keen appreciation of justice and conscientious preparation as that of examiner on a board of pharmacy.

All of these qualifications Lucius Walton possessed to an unusual degree. He was in the minds of many the ideal Pharmacy Board member. The Proceedings of the National Association of Boards of Pharmacy and of District No. 2 of that Association are replete with practical suggestions for conducting the work of Pharmacy Boards and for elevating professional standards, emanating from the fertile mind and long experience of this Master of Pharmacy.

Dr. Walton's life span paralleled some of the most significant developments and changes in American Pharmacy. He was a keen student of these changes and sought to adapt himself and the professional activities for which he was responsible to the changing order, without ever sacrificing the fundamental principles of good pharmaceutical practice to expediency.

Honors were bestowed upon Dr. Walton at various times during his career for services well rendered. Although richly deserved and without doubt greatly appreciated by the recipient, they were received in the spirit of humility which characterizes the truly great in every walk of life.

It was a treat to watch Lucius Walton preside over an assemblage such as the House of Delegates of the AMERICAN PHARMACEUTICAL ASSOCIATION. He knew parliamentary procedure as well as he knew pharmacy—and that is saying a great deal. He was never at a loss for the proper procedure to handle a difficult situation, and although very patient with those whose lack of knowledge of parliamentary law caused many a snarl and tangle in the management of some of our pharmaceutical meetings, he frequently deplored the fact that many of those who accept appointment as presiding officers of our pharmaceutical associations do not take the trouble to acquaint themselves with the rules and by laws under which they are expected to function. The tendency toward placing a premium on mediocrity sometimes resorted to in organizations in order to serve the ends of political expediency was always repugnant to Dr. Walton. He will be sorely missed in the councils of the National Association of Boards of Pharmacy, the AMERICAN PHARMACEUTICAL ASSOCIATION and the many other groups who leaned heavily upon his advice and experience.

No better sentiment can be found to close this brief and totally inadequate appreciation of one of America's most outstanding pharmacists than the one which he himself uttered in commenting upon the departed in his Presidential Address of 1926:

'Death's transfiguration into the dimly outlined image of Eternal Love makes sacred our beloved We are quickened to new resolves and impulses to better living by the blessed lives thus transmuted into our lives, and this birth in death tempers the sadness of the passing of our associates "

ROBERT P FISCHER

## OBITUARY

### LUCIUS LEEDOM WALTON

Lucius Leedom Walton, the 73rd president of the AMERICAN PHARMACEUTICAL ASSOCIATION and member of the ASSOCIATION since 1904 died December 26, 1935, in the Clifton Springs Sanitarium, New York, after an illness of several months Mr Walton's health had not been good for several years

There are events in the lives of all men that stand out above all other preferments It



LUCIUS L WALTON

was the privilege of this writer to attend a testimonial given to Mr Walton after he was elected President of the AMERICAN PHARMACEUTICAL ASSOCIATION The citizens of Lycoming County came to do him honor and all the drug stores of Williamsport closed their stores so that proprietors and assistants could attend the dinner The members of Lycoming Medical Society attached their signatures to an expression of professional regard in a beautiful memorial volume neatly embossed and attested by the seal of the Society The papers of Williamsport expressed their high regard in

editorials The tributes paid the deceased evidenced the high regard in which he was held not only in his home town but throughout the state

Mr Walton was born at Clinton N J July 8 1865, son of Thomas Cooper and Jane Eliza Walton Here he received his early education and having chosen pharmacy for his life work he matriculated at the Philadelphia College of Pharmacy and was graduated in 1888 as one of the honor men in his class He was manager of Barnum's Pharmacy in Danbury Conn, for several years In 1892 he opened a pharmacy in Williamsport, Pa, which he continued to operate until the time of his death

Mr Walton was appointed a member of the Pennsylvania Board of Pharmacy in 1906 and was a member until his demise, for seventeen years of his membership on the Board he was its secretary He served the Pennsylvania Pharmaceutical Association as Treasurer Secretary, Vice President and President In 1921 he was elected president of the National Association Boards of Pharmacy For several years prior to his election he was chairman of the Executive Committee and after serving as its president he again was named chairman of the Executive Committee In 1923 Mr Walton was elected chairman of the House of Delegates and two years later president of the AMERICAN PHARMACEUTICAL ASSOCIATION

In 1912 his Alma Mater conferred on him the Degree of Master in Pharmacy and in the same year the Pittsburgh College of Pharmacy honored him with the degree of Doctor of Pharmacy

In 1890 Mr Walton was married to Miss Cora Olive Brooks, of Williamsport, three children were born to them Mrs Louis Saalbach Pittsburgh, Mrs Lowell Budinger, Williamsport, Brooks Lamar, teacher at Hackensack, N J Mrs Walton, who survives her husband, was a frequent attendant at the annual meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION

Mr Walton was treasurer of the Grace Methodist Episcopal Church for twenty five years. An editorial of one of the home papers, which is typical of all the others closes with these words: "His name merits a high place in the list of Williamsporters of whom their city may well be proud."

### WILLIAM L STEARNS

William L Stearns, one of the oldest as well as one of the best known members of the Pharmacy Corps of the U S Public Health Service, died at the U S Marine Hospital, Stapleton Staten Island on January 17, 1936, where he had been under treatment for a number of months.

Mr Stearns's career as a pharmacist in the Corps of the U S Public Health Service was a long and distinguished one. He was appointed in 1892 and remained on active duty until September of 1933, at which time he was retired. He served at the largest hospitals of the Service in the East at Boston, New York, Dansville, N Y, and at several of the principal southern quarantine stations during the period when yellow fever scourged that section of the country each summer. He rendered service at the special temporary quarantine camp, which was established at Sandy Hook, N J, in the summer of 1892, when Asiatic Cholera was epidemic in several European ports.

He was for many years on duty in New York City in connection with Medical Purveying Depot and Supply Service.

He was a graduate of the Massachusetts

College of Pharmacy. In 1930 he was commissioned as a pharmacist officer of the United States Public Health Service in accordance with the provisions of the Parker Bill.

He was buried in Lynn, Massachusetts.—H

### J ALLEN TAILBY

J Allen Tailby—of the Tailby Nason Company, Cambridge, Mass.—member of the AMERICAN PHARMACEUTICAL ASSOCIATION, died January 10, 1936, aged 70 years.

Mr Tailby was born at Hunters Point, New York, February 1, 1866. The family removed to Wellesley, Massachusetts, when he was three years of age. He attended the elementary schools in Wellesley and graduated from the Chauncy Hall School of Boston. Following a special course in chemistry at Clark University, Worcester, he entered the Massachusetts College of Pharmacy and graduated from the college May 24, 1888. He was one of the founders in 1905 of the Tailby Nason Company of Massachusetts and was president and a director of the company until June 1910, when it was reorganized as the Tailby Nason Company of Maine. He continued to serve as a director of the Maine corporation until the time of his death.

The deceased had served on various town committees and at the time of his death was *Chairman* of the Board of Health of Wellesley. He was a member of the Boston Druggists' Association, the American Chemical Society, and also of the Contact Committee of the American Pharmaceutical Manufacturers Association.

(Continued on page 88)

## SOCIETIES AND COLLEGES

### CONVENTIONS

The 59th annual Convention of the Pennsylvania Pharmaceutical Association will be held at the Bellevue Stratford Hotel Philadelphia, June 16th, 17th, 18th. The N A R D will hold its annual meeting at the William Penn Hotel Pittsburgh, September 21st, 22nd, 23rd, 24th, 25th.

The Kansas Pharmaceutical Association will convene in the Hotel Jayhawk, Topeka, April 13th to 16th.

The Missouri Pharmaceutical Association meets in St. Joseph, April 21st to 23rd.

Oklahoma Pharmaceutical Association holds its annual session at Enid, April 21st to 23rd.

Iowa Pharmaceutical Association meets in Davenport, February 4th to 6th.

Nebraska Pharmaceutical Association has selected Hotel Fontenelle as headquarters, February 18th to 21st. The Northwest Drug Show will be held in the Auditorium, a few blocks away from the headquarters.

Arkansas will hold its annual convention, June 9th, in Little Rock, at the Marion Hotel.

The Federal Wholesale Druggists' Association will hold its mid-winter meeting in the Hotel Roosevelt, New York, February 25th-27th. The first day will be devoted to a joint meeting of active (cooperative wholesale) and associate (manufacturing) members for an open discussion of trade subjects.

The Canadian Pharmaceutical Association will meet in Bessborough Hotel Saskatoon, Sask., during the week of August 17th

The Purdue Pharmacy Extension Department was instituted six years ago to assist druggists of the state who wish to apply to their stores some of the principles and methods studied and promoted by the Department. The annual druggist business conference will be held March 25th and 26th

### JAPANESE PUBLIC HEALTH INSTITUTE

The Rockefeller Foundation has provided a building for the Japanese Public Health Institute. The proposed building will be a five story reinforced concrete one. The Institution will be used for the training of health technicians and officials in charge of administration affairs.

### OFFICERS OF TEXAS PHARMACEUTICAL ASSOCIATION

B B Brown, Dallas, was elected president of the Texas Pharmaceutical Association by its executive committee to succeed C C Harris Houston, who resigned recently. Festus Pierce Corsicana, and W V Paul El Paso were named vice presidents. Mr Pierce will be legislative committee chairman, assisted by E E Weaver, Fort Worth and Carter Summers, San Antonio.

Plans to entertain the AMERICAN PHARMACEUTICAL ASSOCIATION convention in Dallas in August were discussed. Walter D Adams was named Local Secretary.

San Antonio was selected as the convention city for the State meeting June 8th to 11th, with Roy Phillips in charge of the drug show.

### OFFICERS OF ARIZONA ASSOCIATION

Since the recent convention of the Arizona Pharmaceutical Association, held during October in Tucson, there has been a change in the roster of its officers. Newell W Stewart of Phoenix, assumes the office of *First Vice President*, following the resignation of Andrew P Martin. L R Johnson, of Tucson, is *Second Vice President*, Fred W Moore of Flagstaff is the *President*, Lawrence Evans Jr Phoenix, is the *Executive Secretary*, *Executive Committee* Russell Meadows, J B McDonald, J B Ryan.

### SOCIETY FOR THE HISTORY OF PHARMACY

The annual meeting of the Society for the History of Pharmacy will take place in Stuttgart.

A definite date has not been fixed but it will be held in June.

The new officers of the Society are as follows: *President* Dr L Kofler, Innsbruck, Germany, *Vice President*, Dr J A Haefliger, Basel, Switzerland, *Chairman of Publicity*, Dr Fritz Ferchl, Mittenwald, Germany, *Librarian*, Dr Alfred Adlung, Berlin, Germany, *Treasurer and Director*, Dr Hans Hoesel, Berlin, Germany.

### SOUTH DAKOTA

The power of the South Dakota State Board of Pharmacy to reject applications for Pharmacy license was upheld in a Circuit Court decision rendered by Judge L L Fleeger. The case arose as a result of a refusal to license an applicant. Counsel for the plaintiff sought to prove the unconstitutionality of part of the law. The Judge's decision supports the State Board of Pharmacy.

### DEFINES "INDUSTRIAL ALCOHOL USES"

The Federal Alcohol Administration Act passed at the last session of Congress, covers alcohol and distilled spirits for non-industrial use. The regulations just issued define what type of spirits are to be regarded as for industrial use, hence exempt from the provisions of the law. These industrial uses are:

1. Use of tax-free alcohol by any governmental agency, state or federal or any scientific university or college of learning, or by any laboratory exclusively in scientific research or by any hospital or sanatorium.

2. Use of alcohol or other distilled spirits of wine which has been lawfully denatured or otherwise rendered unfit for beverage use.

3. Uses of distilled spirits or wine for experimental purposes, and in the manufacture of medicinal pharmaceutical or antiseptic products, including prescriptions compounded by retail druggists, of toilet products, of flavoring extracts, syrups or food products or of scientific, chemical, mechanical or industrial products, provided such products are unfit for beverage use.

The new regulations continue in effect the old regulation which provided that distilled spirits in containers of a capacity of one wine gallon or less, except anhydrous alcohol and alcohol which may be withdrawn tax free under the internal revenue laws, will be deemed to be for non-industrial use, hence subject to the act.

## VIRGINIA PHARMACEUTICAL ASSOCIATION

Virginia Pharmaceutical Association will hold its mid-year meeting at Richmond John Marshall Hotel February 11th and 12th

The annual meeting will be held on board the Steamship Reliance, sailing from Norfolk to Bermuda and return, June 14th-19th

## DEDICATION OF REMINGTON MEMORIAL LABORATORIES

In connection with the annual conferences and exhibits of the Philadelphia College of Pharmacy and Science the Remington Memorial Laboratories were dedicated January 31st. The donors are alumni of the College—Josiah K. Lilly (1882), Eli Lilly (1907), the presentation was made for them by Edward J. Hughes of Eli Lilly & Co. and accepted for the College by Dean Charles H. LaWall.

The control division of the laboratory is on the second floor—it is for the application of the official physical, chemical and botanical tests and assays used in the examination of ingredients and finished chemical and pharmaceutical products. The manufacturing division is on the ground floor. Here is located apparatus used in the pharmaceutical manufacturing processes.

A professional symposium and exhibit was part of the day's program with demonstrations of the relationship of pharmacy chemistry, bacteriology and biology in the efforts to cure disease and maintain health. References to the addresses and the exhibits will have to be deferred.

The program also included the presentation of the Procter Award for 1936 to Dr. William Boswell Castle, assistant professor of Medicine at Harvard Medical College, in recognition of an outstanding contribution to medicine and pharmacy. The subject of the recipient's address was "New Developments in the Products for the Treatment of Pernicious Anemia."

Chairman E. Fullerton Cook spoke on "Significant Features of the New Pharmacopœia" and Secretary Adley B. Nichols discussed "The New National Formulary."

Dr. Owen Stanley Gibbs, M.B., Ch.B., recently was appointed professor of pharmacology and chief of the division of pharmacy and materia medica of the University of Tennessee.

The following were elected officers of the Association of Official Agricultural Chemists: President H. H. Hanson, State Board of Agri-

culture, Dover, Del.; Vice President C. C. McDonnell, Washington; Secretary Treasurer W. W. Skinner, U. S. Bureau of Chemistry and Soils, Washington; Members of the Executive Committee H. R. Kraybill, La Fayette, Ind.; W. S. Frisbie, Washington, D. C.; C. L. Hare, Auburn, Ala.; F. E. Blanck, Washington, D. C.

Dr. P. A. Foote, of the University of Florida, was the principal speaker at the annual banquet of the Volusia County Pharmaceutical Association to the physicians, at Daytona, on January 22nd. The subject was "Cooperation."

## GERMAN APOTHECARIES WILL VISIT THE UNITED STATES

The tour of the German Apothecaries scheduled for a year ago has been arranged for April of this year and cities thus far named in the itinerary are New York, Buffalo, Detroit, Chicago, Philadelphia and Washington. The AMERICAN INSTITUTE OF PHARMACY is listed the party will reach Washington on April 26th.

## LAW MAKING BY MODEL

*The Oil Paint and Drug Reporter* of January 27th closes an editorial with the following paragraph: "The fixing of a resale price by contract between manufacturer and dealer is valid in this State. It would not be in Montana, whose constitution specifically forbids the making of such contracts. Constitutional provisions in Idaho and New Hampshire may be applied with similar effect, although Idaho has a law (enacted in 1911) making it illegal to sell any article at less than its fair market value." The constitutions of five or six other States have provisions that make even contractual price fixing difficult if not impossible. To make an effective law much more than a model is necessary."

## SENATOR TYDINGS REVISES FAIR TRADE MEASURE

On January 27th Senator Millard L. Tydings introduced a revised draft of the fair trade measure S. 3822, the provisions of which are:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled: That Section 1 of the act entitled "An act to protect trade and commerce against unlawful restraints and monopolies," approved July 2, 1890, is amended by striking out of the period at the end of the

first sentence thereof and inserting in lieu thereof a colon and the following: Provided, That nothing herein contained shall render illegal contracts or agreements prescribing minimum prices or other conditions for the resale of a commodity which bears, or the label or container of which bears the trade-mark, brand or name of the producer of such commodity and which is in free and open competition with commodities of the same general class produced by others, when contracts or agreements of that description are lawful as applied to intrastate transactions, under any statute, law or public policy now or hereafter in effect in any State Territory or the District of Columbia in which such resale is made, or to which the commodity is to be transported following such resale, and the making of such contracts or agreements shall not be an unfair method of competition under Section 5, as amended and supplemented, of the act entitled 'An act to create a Federal Trade Commission, to define its powers and duties, and for other purposes,' approved September 26, 1914."

#### COPELAND DRUG BILL INTRODUCED IN HOUSE

Apparently with an idea of forcing action in the House on food and drug legislation, Representative Martin J. Kennedy of New York, in a surprise move January 13th, introduced in the House the Copeland bill in the form in which it passed the Senate. The Kennedy bill is known as H. R. 10124—*Drug Trade News*.

#### THE OPINION INVALIDATING PRICE FIXING IN NEW YORK LAW

##### COURT DECISION BASED ON SECTION 2

'Section 2 is that part of the law which is questioned in this case. The interpretation given below to this section and by all the parties apparently is that it attempts to accomplish just what the plaintiffs claim for it, as stated in the complaint and as given above. But for this we would have grave doubts whether the Legislature ever intended to fix the price of books after they had been purchased in the open market under no agreement as to resale price. Thus it is possible to read Section 2 as referring to the contract made under Section 1 or, as binding on those books like an equitable servitude which had been parted with under a contract as to resale price.

"However for the purpose of this appeal we confine ourselves to the question of the constitutionality of the statute as construed by

the parties and the court below and treat this section as allowing book price-fixing in the absence of contract made by the purchaser or his agents.

'We agree with Special Term that, if this be its meaning, the law is unconstitutional. That the States cannot fix the selling price of any and all commodities has been settled (*Williams Co vs Standard Oil Co* 278 U. S. 235, *Tyson & Bro vs Banton*, 273 U. S. 418, *Wolff Co vs Industrial Court*, 262 U. S. 522, *Straus vs Victor Talking Mach Co* 243 U. S. 490.)

'Books at least these books, are not 'affected with a public interest' any more than theatre tickets, no emergency has yet arisen in literary publications, and the business is not such as comes within the classes which must submit to rate fixing."

#### BOERNER'S PHARMACY WEEK WINDOW

Edward S. Rose of Iowa City, is doing honor to the memory of his predecessor in Boerner's Prescription Pharmacy. The founder of the pharmacy, Emil P. Boerner, was an honored member of the profession and of the A. P. H. A.

The following explains the window in part.

Title—Ethics of Pharmacy—based on the Code of Ethics of the AMERICAN PHARMACEUTICAL ASSOCIATION which is divided into three parts—

- 1 The Pharmacist and the Public
- 2 The Pharmacist and the Physician
- 3 Relation—Pharmacists to Each Other

'On display—

'Certificates of Registered Pharmacists Membership in AMERICAN PHARMACEUTICAL ASSOCIATION. Postal pictures of AMERICAN INSTITUTE OF PHARMACY. U. S. P.—N. F.—U. S. Dispensatory. Eighty U. S. P. and N. F. preparations.

Boerner's Pharmacy subscribes to the Code of Ethics of the AMERICAN PHARMACEUTICAL ASSOCIATION."

#### CONSIGNMENT SALES BANNED

Administrator Franklin C. Hoyt recently announced that any sale of alcoholic beverages in which title is not transferred at the time of shipment and which does not involve some form of settlement, in cash or on open account, is unlawful. Returns made for ordinary commercial reasons arising after the merchandise is sold are excepted.



## BOOK NOTICES AND REVIEWS

*A Textbook of Anatomy and Physiology* By JESSE FEIRING WILLIAMS M D Professor of Physical Education, Teachers College Columbia University New York City Fifth edition revised with 416 illustrations, 31 in color Published by W B Saunders Company, Philadelphia, Pa., 1935 Price \$2 75

It is peculiarly difficult to obtain satisfactory textbooks in physiology to be used in connection with courses in pharmacy schools The general tendency appears to be to use a book prepared or intended for use in pre-medical courses omitting certain sections on the ground that they are unduly complicated " A number of physiology texts have been prepared for the presentation of general physiology but these drift into the realms of speculation philosophy or statistics This book presents the essentials of anatomy and physiology for students of the practical arts—nursing physical education physiotherapy, occupational therapy and household arts " It is arranged to serve the needs of students of anatomy and physiology outside the medical field In the fifth edition the original plan has been conserved By 416 illustrations 31 in color, the essential features of the text are clarified The book lays a fundamental stress on the importance of the cell the embryological formation, the nature of the epithelial, connective, muscular vascular and nervous tissue are pointed out in connection with practical use in the body The nature and formation of the skeleton is followed by the insertion of the muscles their operation by means of the nervous system their maintenance by the circulatory and respiratory systems and their nutrition by the digestive system Finally the excretory system is discussed with its job of removing waste material Chapters on the reproductive system the endocrines and the special senses are then presented A host of useful and impressive facts statistics and applications are presented Each chapter closes with a series of practical exercises and test questions which greatly facilitate presentation to students A limited number of references are given One of the outstanding features is the 30 page glossary

This textbook will serve a useful purpose for reference by teachers and students as well as for a text for anatomy and physiology — JAMES C MUNCH

*List of Trade Names*—A Supplement to the List of Trade Names registered with the

American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers Association, is now ready for distribution The main list was released August 1, 1934, and the present supplement represents additions, corrections and deletions up to August 1, 1935 The purpose of these lists is to furnish information in the preliminary consideration of new trade names It is the desire of the Associations that the booklets receive the widest possible circulation not only among members but among all others interested in this important field, including firms and individuals identified with allied organizations trade mark attorneys and association trade-mark bureaus

The principal list was offered at fifty cents, the price of the supplement is twenty five cents a copy However if the two publications are ordered together they will be furnished for a total of fifty cents Copies may be obtained from Carson P Frailey Executive Vice President and Secretary, American Drug Manufacturers' Association 507 Albee Building, Washington D C or from Clarence W Warner Secretary, American Pharmaceutical Manufacturers Association 250 High Street Newark New Jersey Check or coin should be forwarded with order

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 GEORGE M BENNETT

George M Bennett member of the AMERICAN PHARMACEUTICAL ASSOCIATION and veteran member of the Illinois Pharmaceutical Association its treasurer from 1919 to 1935 and a long time Urbana druggist died in Carle hospital Urbana December 17th

Mr Bennett was born September 1 1863 in Champaign Ill In 1887, following school days and an apprenticeship he bought an interest in a drug store in Urbana and formed a partnership with his brother in law, E N Knowlton He owned and conducted this pharmacy until the time of his death

In 1911 Mr Bennett was presented with a silver loving cup as a distinguished citizenship award by the Association of Commerce

Mr Bennett was a member of the masonic bodies He was married in 1890 to Miss Emma C Yanos who survives him

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# JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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No 2

## GEORGE DENTON BEAL

George Denton Beal, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1907, and President-Elect of the ASSOCIATION, was born in Scio, Ohio, August 12, 1887, the son of James Hartley Beal<sup>1</sup> and Fannie Snyder (Young) Beal. After concluding his preliminary education he entered Scio College of Pharmacy, where, in 1906, he earned the degree of Ph C. Continuing his studies at this institution he received the degrees of Ph B and Pharm D. In 1910, he entered Columbia University as the Richard Butler Scholar in Chemistry, receiving, in course, the degrees of A M and of Ph D, from the University.

Following the completion of these studies Dr. Beal was appointed Instructor in Chemistry at the University of Illinois, he held this position until 1914, when he was advanced to Associate in Chemistry at the same institution. Herein he served until 1918, when he was elected Assistant Professor of Chemistry, which position he held until 1920. He was then named Associate Professor of Analytical and Food Chemistry and thereafter, until 1926, he occupied the *Chair* of Analytical and Food Chemistry. In the latter year he received the appointment as Assistant Director at Mellon Institute of Industrial Research, which position he still holds.

Dr. Beal was awarded the Ebert Prize in 1920. The paper specifically mentioned for the honor was "The Shaking-Out Method for the Quantitative Estimation of Alkaloids," read before the New York meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1919 and published in the January JOURNAL for 1920, pages 9-15. His research on "Anthraquinone Drugs" is well and favorably known and other lines of work might be mentioned in this connection, but this would extend the sketch beyond its purpose.<sup>2</sup>

His activities have associated him with pharmaceutical and chemical organizations. He was First Vice-President of the A. P. H. A. in 1934-1935, he is a member of the American Chemical Society, *fellow* of the American Association for the Advancement of Science, *fellow* of the American Health Association, member of the American

<sup>1</sup> President of the AMERICAN PHARMACEUTICAL ASSOCIATION 1904-1905

<sup>2</sup> See indexes of JOURNAL A. P. H. A. beginning with Volume V and succeeding numbers

Society for Testing Materials, National Conference of Pharmaceutical Research, Pennsylvania Academy of Science, member of the Board of Directors of Pittsburgh College of Pharmacy, Honorary member of Illinois State Pharmaceutical Association

The Philadelphia College of Pharmacy conferred on him the honorary degree of Ph M and Mt Union College honored him with the degree of Sc D

He is a member of Phi Lambda Upsilon, Honorary Chemical Society, and was its national president, 1917-1919, he is a member of Alpha Chi Sigma, Lambda Chi Alpha, Gamma Alpha, Sigma Xi, University Club of Pittsburgh, Church II Valley Golf Club, Chemists' Club of New York Dr Beal was a collaborating member of the Committee of Revision, U S Pharmacopœia X and a member of the Committee of Revision U S Pharmacopœia XI, chairman of the Sub-Committee on Organic Chemicals From 1922-1927 he was chairman of the Sub-Committee on "Anthraquinone Drugs," Committee on Medicinal Products, Division of Chemistry of the National Research Council

Dr Beal married Miss Edith Downs, July 3, 1912, at Scio, Ohio, two children, George Denton Beal, Jr, and Marjorie Downs Beal have brightened their home

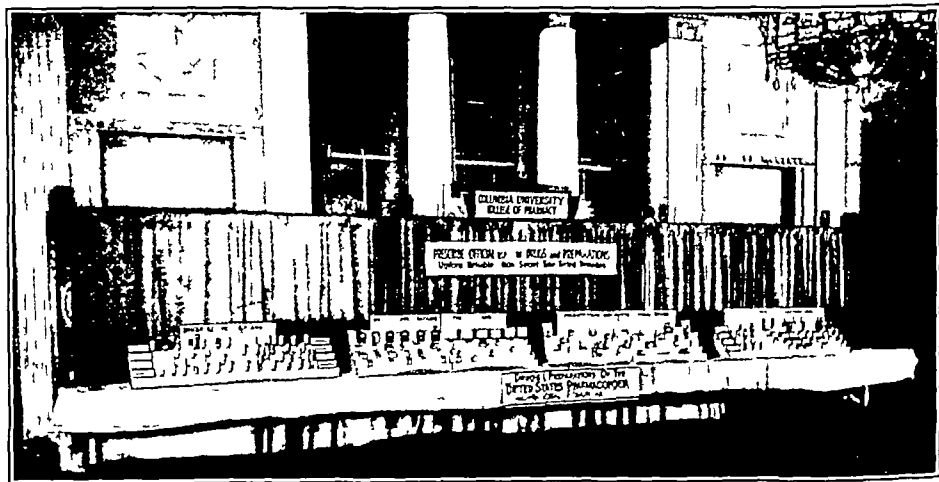


Exhibit of Drugs and Preparations of the United States and of National Formulary by Columbia University College of Pharmacy—On the occasion of the meeting of the Military Surgeons Association of the United States held in New York City October 3rd-5th at the Waldorf Astoria

The display on the left was made up of U S P and N F drugs the second group consisted of useful Preparations, the next of Prescriptions containing official drugs, and the fourth section displayed Dental Drugs and Preparations

A page of the *Military Surgeon* for December shows 20 displays on all phases of military medicines and among them the exhibit referred to in the foregoing

# EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave., WASHINGTON, D C

## THE HEALTH OF THE PEOPLE

THE government has not been unmindful of the services of the professions engaged in public health service, but there is possibility of coördinating the work, whereby the health of the citizens will receive better protection. The work of the government divisions is outstanding and the education of the public by the publicity given is worthy of most favorable comment, but with all of that pharmacy could more effectively enter the field and prove its value, this to a certain extent may be the fault of pharmacists. There is evidence, however, of great progress in the movements to promote professional pharmacy. Efforts to increase the representation in the various government services are meeting with encouragement and it remains for pharmacists to prove the need for pharmacy in the various activities and for pharmacists to meet these opportunities.

There is greater need for pharmacists in hospitals to be represented as essential in the service and also greater evidence of pharmacy in public life. An article by Dean Edward Spease on Minimum Standards for a Hospital Pharmacy appears in the January JOURNAL.

## BRITISH AND AMERICAN PHARMACY

IT IS gratifying to note the interest of the British pharmaceutical publications in the U S Pharmacopœia and National Formulary. Dr C H Hampshire is reviewing the U S P XI in the *Pharmaceutical Journal* of the Pharmaceutical Society of Great Britain. This cooperation is welcomed not only as an evidence of the professional relations, but because it will be of value in the interim and decennial revisions and thereby to pharmacy on both sides of the Atlantic. The *Pharmaceutical Journal* comments:

"It is probable that much more interest will be taken in the future by British pharmacists in the decennial revisions of the United States Pharmacopœia than has been the case in the past. The sub-committee which in 1928 reported on the changes that it considered should be made in the preparation of the British Pharmacopœia, suggested that active cooperation with the compilers of the U S P might be effected, and some coordination made in order that successive issues of one pharmacopœia should appear mid-way in the intervals between the issues of the other pharmacopœia. This interchange of views has been practiced by the present Pharmacopœia Commission, through the respective secretaries, and an acknowledgment of its value to the Committee of Revision of the U S P is made in the following terms in the preface to the new United States Pharmacopœia:

"A gratifying feature of the revision work of this decade has been the close coöperation between the British Pharmacopœia Commission and the Committee of Revision of the United States Pharmacopœia. The free exchange of reports and discussions, the coöperative researches on important subjects, and an effort to harmonize the titles and standards of the two pharmacopœias have characterized the period. This program should greatly benefit both books and lead to a greater degree of perfection in official standards."

## NATIONAL FORMULARY VI

THE *Chemist and Druggist*, of February 1st, reviews the National Formulary, giving a full page to the subject. The opening paragraph states that "the

issue in the United States of a new edition of 'The National Formulary' is an event awaited with pleasurable expectation in many countries "

The review continues with a general comment, an appreciation of the compilers and the evident care in the preparation of the Formulary The comprehensive review outlines the work in a way that gives the readers information relative to the plan and scope of this revision The publications have exhibited the professional spirit, which should obtain within the professions in rendering service

The review concludes "N F VI worthily sustains the reputation of earlier editions, and forms a book of reference indispensable to the serious student of formularies "

Thanks are extended the reviewers with hopeful wishes for continued and strengthened reciprocal relations

### INTERNATIONAL PHARMACY COOPERATION

IN THIS issue of the JOURNAL two articles of foreign contributors are published, one by the director of the Department of Pharmacology of Masaryk University Medical School and the other is from the Department of Pharmacology, National University of Mexico

Chairman E Fullerton Cook refers to Pan-American Cooperation in his comprehensive article<sup>1</sup> on "A Pharmacopœia for To-day's Needs " He states

"It is gratifying to announce that the Pan-American Sanitary Bureau, through its director, Dr Hugh S Cumming, Surgeon General of the United States Public Health Service and its Assistant Director, Dr Boliver J Lloyd, and their staff, have undertaken the translation of the U S P XI into Spanish as an official activity of the Bureau It is hoped that the Spanish edition will be available by April next when a large Pan-American Medical Congress will be held in this country

"It is also expected that the medical articles on the use of official medicines, appearing in the *A M A Journal*, will be translated into Spanish and reprinted in the official Bulletin of the Bureau for circulation through the twenty-one republics affiliated in the Pan-American program

"It should be understood, however, that the policy of the U S P Board of Trustees in translating the U S P into Spanish now for four decades has been primarily that it might be available to pharmacists and physicians in Porto Rico, the Philippines and in Cuba In the latter republic the U S P has been adopted as the official Pharmacopœia for more than thirty years and has been made possible through these years by the cooperation of the pharmacists of Cuba and the help of the scientific staff of the University of Havana and especially Dr José Guillermo Diaz

"In the present revision Auxiliary Commissions from Cuba, Porto Rico and the Philippines have been participating in the revision (see the U S P XI, page viii)

"It is expected that each of the other republics affiliated with the Pan-American Union will eventually issue their own Pharmacopœia as is now done by Mexico, Brazil, the Argentine and others, but in offering the U S P in Spanish it has been hoped that increased uniformity in nomenclature, tests and standards will be secured on this continent "

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<sup>1</sup> An address before New York Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, January 13th

## SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS — *Chairman*, F E Bibbins, Glenn L Jenkins, John C Krantz, Jr.,  
Heber W Youngken, L W Rowe, L W Rising, C O Lee, E V Lynn, W G Crockett,  
Frederick V Lofgren

### A MODIFIED ASSAY FOR SOLUTION OF MAGNESIUM CITRATE \*

BY W F REINDOLLAR AND H E CHANEY

Although Solution of Magnesium Citrate has enjoyed official status since 1850, it was not until the appearance of the ninth decennial revision of the Pharmacopœia, in 1916, that an assay was provided. This assay, which is practically identical with the present one, is unsatisfactory in several respects. It requires evaporation of the solution to dryness and subsequent charring of the organic material prior to precipitating the magnesium. This is a cumbersome procedure and, unless extreme care is exercised, will be attended by loss of superheated particles which are ejected with explosive violence. Furthermore, a long period of standing followed by drying and ignition of the precipitate is directed, which greatly lengthens the time period required for a single determination.

Various suggestions have been made to simplify and shorten this procedure. Noteworthy is that of Mayer (1), verified by Haussmann (2), in which the original sample is diluted with distilled water and acidified, and precipitation is effected without recourse to a preliminary drying and charring. The practicability of this phase of the determination has been so thoroughly demonstrated that it has been accepted as part of the assay for solution of magnesium citrate in the forthcoming Pharmacopœia (3).

Recently J P Mehlig published a method (4) for determining magnesium as magnesium ammonium phosphate hexahydrate. The method involves the precipitation of this compound in the usual manner, its subsequent filtration and washing with dilute ammonium hydroxide, alcohol and ether on a Gooch crucible, drying in a desiccator for twenty minutes, and weighing. Compared with the ignition method this procedure, to quote the author, "is more rapid, less tedious, and more easily carried out, and there is no black residue." With a view to further simplifying the official assay a comparative study of this method and the Pharmacopœial determination was made. A dozen samples of solution of magnesium citrate, purchased in the open market and submitted to the Bureau of Chemistry during July and August were assayed by the U S P XI procedure and by that of Mehlig. The results are tabulated on page 96.

#### DISCUSSION OF RESULTS

These results confirm the findings of Mehlig and demonstrate the applicability of his procedure to the official solution of magnesium citrate. Since there is no ignition, care must be observed to have the portion taken for analysis free from any insoluble extraneous material of an organic nature. If necessary filtration of the product must be resorted to. This was not found necessary for any of the samples examined.

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\* Bureau of Chemistry, State of Maryland, Department of Health

TABLE I

Sample	MgO as		Deviation
	Mg <sub>3</sub> P <sub>2</sub> O <sub>7</sub>	MgNH <sub>4</sub> PO <sub>4</sub> ·6H <sub>2</sub> O	
4115 D	1 529	1 543	+0 014
4154 D	1 542	1 546	+0 004
4162 D	1 566	1 563	-0 003
4191 D	1 689	1 695	+0 006
4192 D	1 739	1 732	-0 007
4205 D	1 533	1 540	+0 007
4206 D	1 515	1 519	+0 004
4237 D	1 585	1 575	-0 010
4260 D	1 825	1 840	+0 015
4280 D	1 600	1 610	+0 010
4288 D	1 872	1 875	+0 003
4311 D	1 552	1 561	+0 009

## SUMMARY

A comparative study has been made of the U S P XI and the magnesium ammonium phosphate hexahydrate methods in the assay of solution of magnesium citrate

The latter has been found to be sufficiently accurate, and is more rapid, and less tedious than the official procedure

## REFERENCES

- (1) Mayer J L *Jour A Ph A* 9 253 (1920)
- (2) Haussmann H W *Am J Pharm* 103, 44 (1931)
- (3) Page Proof U S P XI page 218
- (4) Mehlig J P *J Chem Ed*, 12 288 (1935)

## A FURTHER NOTE ON THE STABILITY OF SODIUM SULPHITE

BY A H CLARK AND SOLOMON GERSHON \*

Reports have previously been made<sup>1 2</sup> on this subject and since quite a number of the specimens of sulphite are still in existence a final report is presented on their condition in March 1935. Some of these samples are twenty-three years old and none less than twenty-one years old. The final result is tabulated below and shows the condition of the samples after all these years of storage in a cupboard in the laboratory. Special comment is made in a few cases. Complete data on each sample may be had by reference to the original articles.

The method of assay used in 1935 was that of the U S P IX, the same method originally used.

CONTENT OF Na<sub>2</sub>SO<sub>3</sub>

Manufacturer	No	Original	1914	1916	1935	Container
A	2	90 80	91 40	90 89	91 03	Paper
A	4	90 80	90 84	89 50	80 09	Glass
A <sup>1</sup>	6	45 19	45 19	39 50	1 37	Tin can

\* University of Illinois College of Pharmacy Chicago Illinois

<sup>1</sup> *Druggists Circular* 58 8 456 (Aug 1914)

<sup>2</sup> *Ibid*, 60 7 396 (July 1916)

B	1	92 04	92 60	91 52	73 80	Tin can
B	2	96 44	96 44	97 17	92 20	Tin can
C <sup>2</sup>	1	94 74	93 91	92 61	91 84	Paper
D	1	84 70	84 70	84 28	82 54	Paper
F	1		94 22	93 00	91 50	Tin can
F	2	92 33	91 76	91 05	90 38	Tin can
F	4	92 50	91 84	91 34	90 67	Glass
G	1		86 27	86 36	86 08	Glass

<sup>1</sup> Sample A, 6, was originally a crystalline sulphite purchased in a tin can. In May 1916 it was still in good physical condition but had lost about 12.50 per cent. In 1916 a part of the sample was placed in a glass stoppered bottle, the remainder left in the original can. The assay given above is for the *crystals placed in the bottle*, and shows almost entire loss of sulphite. Strange as it may seem the sample remaining in the can assayed in 1935 59.00 per cent sulphite. On careful inspection this sample was a fine powder, no crystals whatever. The high content of sulphite is no doubt due to the fact that the can was not air tight and the crystals dried out during the twenty years of storage and this drying process outstripped the deterioration process, thus rendering the remaining portions of the sample more and more stable as the drying went on, the final result being a stable fully dried sulphite. Based upon crystalline sulphite instead of dried, 59.00 per cent would mean about 30 per cent  $\text{Na}_2\text{SO}_3$ , so the actual loss of sulphite was considerable aside from the loss of water which is always an economic one.

<sup>2</sup> Sample C, 1. In 1935 this specimen was found uncovered and very dirty on top, but in spite of this the loss of sulphite was not great.

One may conclude very definitely from the above that a dried sodium sulphite will keep, certainly for three years, probably for five or six years and in some cases as long as twenty years, that crystalline sodium sulphite loses sulphite rapidly, the loss ranging from 12.5 per cent to 100 per cent in two years, that a paper carton or tin can is as safe a container as a glass bottle, that a photographic quality, a U S P quality or an unbranded article is likely to be just as good as an expensive grade.

## THE IMPORTANCE OF THE KIDNEYS IN THE STANDARDIZATION OF DIGITALIS

BY B. BOUCEK \*

The directions in the official publication of the League of Nations for the standardization of digitalis by the method of Hatcher and Brody, as modified by Magnus, require that pregnant cats and those having pneumonia shall not be used for the standardization. It is not explained why such animals are unsuitable, and I have been unable to find elsewhere any statement that any functional or pathological change in any organ influences the result of the test.

It is well known that some individual cats are especially resistant to the toxic action of digitalis. This fact has been confirmed by McFarlane and Masson<sup>1</sup> who state: "Apparently, it represents a separate group of cats which has greater resistance to the toxicity of digitalis and consequently lessens the reliability of this method of assay of the drug unless a large number of animals be done for each estimation."

\* Director of the Department of Pharmacology of Masaryk University, Medical School, Brno Uvoz 33, Č S R Europe

<sup>1</sup> McFarlane A., and Masson G. A., *J. Pharmacol. and Exper. Therap.*, 30, 293 (1927)



We have observed in rare cases differences of about 50 per cent compared with the average minimum lethal dose, some weak and cachectic animals having manifested great resistance. For example, a twelve-year old cat which had chronic bronchitis, calcifications, emphysema of the lungs, a follicular tumor of the spleen, and fatty degeneration of the liver and kidneys, as shown at the post-mortem examination, required 25 per cent more than the average fatal dose to cause death.

Other animals did not suffer from such a variety of pathological conditions, but in every case where great resistance to digitalis was observed pathological changes were found in the kidneys. Only occasionally was there observed any such influence due to pathological changes in the lungs and liver, or to pregnancy. This is shown in the following table.

Table I shows the effects of pregnancy and pathological changes in organs on the toxicity of digitalis for the cat.

TABLE I

## Resistance

Lungs	-13 till	-40 per cent
Liver	-40	per cent average
Kidneys	+30	per cent average
Pregnancy	-30 till	-60 per cent

The variation in the lethal dose is slight in healthy animals, not more than about 10 per cent in our experiments. Many of the animals which are delivered to our department are in bad health, most of them being infested with hookworm. This is also true in America. All animals are now treated with a vermifuge, and they are kept under good conditions for some time before they are used for experiments. In every case where an animal shows increased resistance, it is found that the animal had nephritis.

TABLE II—SHOWS THE EFFECTS OF VARIOUS MEASURES ON THE RESISTANCE OF CATS TO THE TOXIC ACTION OF DIGITALIS

Treatment.	Number of Animals	Resistance	Remarks
Acute uranium nephritis	11	30% higher	Only one injection of 18 to 28 mg $\text{UO}_2(\text{NO}_3)_2$ per Kg
Chronic uranium nephritis	5	Without change	$\frac{1}{2}$ cc solution $\text{UO}_2(\text{NO}_3)_2$ 1-400 every fifth day
Bilateral nephrectomy	11	18% higher	18-96 hours after nephrectomy
Ligature of blood vessels	3	Without change	Immediately after tying
Ligature in cases of inflammation of the kidneys	1	27% higher	Immediately after tying
Ligature of both ureters	5	Without change	
Digitalis with urea	6	20% higher	0.25-1.4 Gm /Kg,
Digitalis with $\text{NH}_4\text{Cl}$	6	20% lower	Isotonic concentration with digitalis

This observation led us to determine the resistance of animals to digitalis under the following conditions (a) In those in which experimental uranium

nephritis had been induced, (b) after nephrectomy, (c) after tying the renal arteries, (d) after tying both ureters. It is interesting to observe that our cats required smaller doses of uranium nitrate than rabbits or guinea pigs.

The tabulated results show that the condition of the kidneys is a very important factor in the determination of the action of digitalis on the heart, and that this factor must not be neglected in the biological standardization of preparations of digitalis.

The immediate cause of the increased resistance to digitalis in the presence of inflammation of the kidneys cannot be determined by the results of the experiments described in this paper.

#### SUMMARY

1 The resistance of cats to lethal doses of digitalis is increased by experimentally induced uranium nephritis.

2 Greater resistance to digitalis was observed in cases of inflammation of the kidneys which occurred naturally. This condition is often observed in cats.

3 This increased resistance must be considered, and only those cats which are free from pathological changes in the kidneys must be used in the Hatcher-Magnus method of standardizing digitalis.

EDITOR'S NOTE We are indebted to Robert A. Hatcher, M.D., of the Department of Pharmacology, Cornell University Medical College, New York, for assistance in the preparation of this paper for publication.

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## ACTION OF TESTICULAR HORMONE ON THE DEVELOPMENT OF THE HEN'S COMB \*

BY DRS. E. RAMIREZ AND M. D. RIVERO

Biological control, that is to say, the experimental production of a specific reaction on an animal or on living tissues, permits us to obtain active extracts of endocrine glands, as long as we can rely on a method revealing the activity of the various extracts and the different fractions, solutions and residues, in the sequela of hormone isolation and purification. It has shown, on the other hand, that a large quantity of extracts and opotherapeutic products, which are prepared regularly for commercial purposes, are completely inactive. Biological control has permitted in some cases to obtain standardization, thus establishing the smallest quantity which could produce a definite and measurable response in certain animals and under some specific conditions.

The specificity of a reaction must be considered as provisional, inasmuch as another product or definite substance, altogether different from the first, may determine a similar action. This happens, for instance, in the horn-shape reaction of the rodent's vaginal epithelium, which is induced not only by folliculin, but also by testicular extracts (Lowe, Lange and Spohr) by filtrates of bacterial cultures (Silberstein, Molnar and Engel), by a lipid isolated from the Koch bacillus (Padersen-

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\* Department of Pharmacology, Faculty of Medicine, National University of Mexico, Mexico, D. F.

Bjergaard), by Clupanadoic acid (Coke), by Yohimbim, etc., all these substances being, of course, different from Teelin

At any rate, biological control is an indispensable guide for the investigation and isolation of active products of the endocrine glands, and we owe to it the finding of the male sexual hormone in an available form

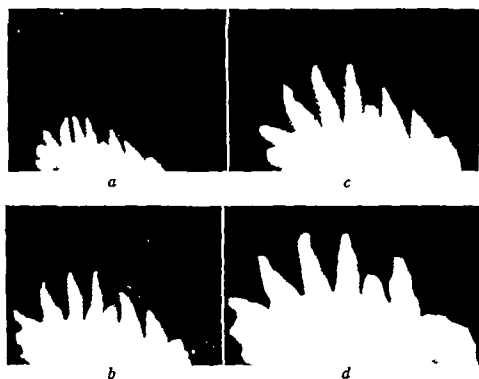


Fig 1—(a) Before treatment (b) After third application (c) Thirteen days after discontinuing the treatment (d) Fifty seven days after discontinuing treatment Daily applications were made during five days

and Voss), anatomic or functional recuperation of the rat's prostate (Gallagher and Moore), of the Cowper glands (Heller), of the preputials (Loewe and Voss), etc. As a control, the inhibitory action of the female's heat (Lendle, Ihrke and d'Amour) and even alleged actions on metabolism (Loewe, Pichter and Pertz) have been tried

In this paper we shall concern ourselves only with the test of McGee and his co-workers (1) consisting of the reaction on the bird's comb

Pézar (2) showed that the regressive comb of the capon takes back its regular size with the testicular graft. McGee and his collaborators proved that the injection of adequately prepared testicular extracts produces a growth in the comb of the brown Leghorn capon. Moore, Gallagher and Koch (3) pointed out that the doses used produce a maximum development of the crest of many birds, thus invalidating the observations for the quantitative determination of the hormone. Later, Gallagher and Koch (4) reported the results of their investigations, using for the purpose brown Leghorn capons, prepared by Dr. Domm. They conclude that there are marked individual differences in the intensity of the response to the action of testicular hormone, and neither age, nor body weight, nor the initial size of the comb, are decisive factors of differentiation. However, they establish a standardization method which defines the cock unit as the lowest hormone quantity which if injected daily during five days, produces a 5 mm growth in length and height

Many tests have been proposed for the identification of male hormone, the reappearance of the "embrace" reflex in male castrated frogs (McCartney), appearance of the nuptial dress of certain fishes, chiefly the *Rhodeus Amorus*, whether castrated (Glasser and Hampel) or not (Wunder), or their greater motility (Stanley and Tescher)

Other numerous tests are based on inducing the development of certain organs of the genital apparatus of male rodents before puberty or castrated the development of the penis in the castrated rabbit (Loewe



Fig 2—Dark silhouette, before treatment. Light silhouette after third brushing

Moore and Gallagher (5) in a paper in which they briefly criticize the control method of testicular hormone, compare the results of these methods in mammals with the result on the capon's crest, and conclude that six cock units equal one rat unit, this being the quantity needed to maintain in normal state, male castrated rats, with daily injections, during 20 days. Laqueur, instead of bearing in mind the absolute growth of the capon's crest, considers only the relative increase of the surface, taking as unit the daily minimum dose which determines in, at least, 2 or 3 capons (brown leghorn) a 15% surface increase. Rudolf Fussgaenger (6) observed that although the capon's crest increase depends on the quantity of hormone used, it does not correspond to a lineal function. In some cases the crest continued to grow after stopping the injections. Another interesting fact shown by Fussgaenger is that the masculine hormone is absorbed by the percutaneous route, its maximum activity being when it is applied with a brush on the very crest. In order to have an equal percentage of growth in the growth in the capon's crest, the following quantities would be needed, taking one as a unit for the amount used on the crest with the brush: 2.5 if the quantity is injected at the root of the crest, 50 if injected intramuscularly and 175 if applied with the brush on the skin of the back.

The castrating of birds has shown, from the first works of Pézard and Caridroit (7), that the development of the cock's crest depends on the testicular hormone action which has no influence on feathers inasmuch as the latter shows no change through castration. On the other hand, the ovarian hormone of hens has

no action on the crest, but modifies the male's feathers as can be shown by grafting ovaries in the capon, which in this case, acquires a hen's plumage. The capon's feathers which are otherwise identical to those of a normal cock, become feminine in appearance through the ovarian graft, on the other hand, the crest is not modified, although it develops



Fig 4—(a) Before treatment (b) After twenty-three brushings

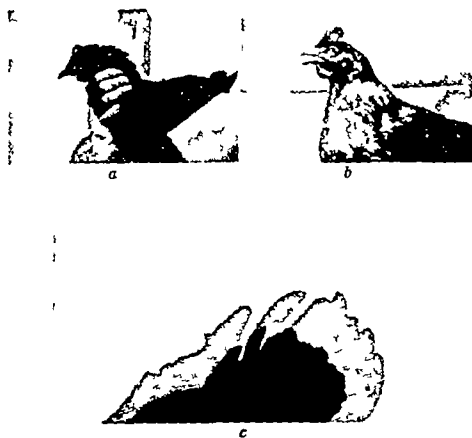


Fig 3—(a) Before treatment (b) After treatment (c) Dark silhouette, before treatment. Light silhouette, after the fifteenth brushing

ostensibly in the castrated hen when testicles are grafted.

From these experiments the conclusion is reached that the hen's crest is physiologically disconnected from the hormonal influence of the ovary. The feather changes show, as Champy and Demay (8) have pointed out, that there is no parallelism between the caloric action of the testicular hormone and the one exerted

by estrin If the interpretation is correct the ovary would not interfere with the action of the testicular hormone, as far as its influence on the crest's growth

In order to confirm this conclusion, we used a testicular extract the activity of which was tested by means of the prostatic and vesicular action in the castrated male rat We used ordinary adult hens which have no spontaneous growth of the comb In order to appreciate the growth of the comb under the influence of masculine hormone, we availed ourselves of the picture of the comb's shadow, placing same between a photographic plate and a glass, as advised by Fréméry The planimetric measurement is easily obtained by placing on the picture of the silhouette a transparent millimetric counting device, this is obtained by printing on a positive film, the negative picture of the micrometric device of arbitrary dimensions, and just reducing same to millimetric scale by focusing on the glazed glass The comparison of the combs, before and after the brush application of hormone was obtained by cutting carefully the silhouettes of direct impression and removing the cuttings to photographic paper, giving less exposure to the largest silhouette The procedure is greatly eased by using castman proof paper

The results confirmed fully our hypothesis the comb of the normal adult hen, responds with greater activity than the crest of capons to the action of testicular hormone, plainly because that organ is not in the hen, in process of regression In one of our observations (Fig 1) the crest continued to grow after the application of the extract was discontinued and the hen's behavior changed in such a way as to assume masculine attitudes We shall not interpret this result until after finishing the histological study of the gonadian right outline

We take from our protocols four observations, the description of which is contained in the notes below the figures which illustrate this paper

We believe that the hen method, on account of its simplicity, sensibility an application to ordinary breeds, can substitute to advantage the use of Leghorn capon, using as control a lot of adult hens and a previously standardized hormone

#### CONCLUSIONS

1 The normal adult hen's comb develops intensely with the action of testicular hormone

2 Due to its simplicity and sensibility the hen can be used to substitute the test on the Leghorn capon, especially if application is made with a brush on the very comb 3 The quantitative appreciation of the effect is afforded by the planimetric measurement of the comb's silhouette obtained by direct application of photographic paper

The quantitative estimate can be obtained by comparison with a previously standardized hormone, using normal adult hens

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## THE MICROSCOPY OF POWDERED, DESICCATED THYROID AND SUPRARENAL \*

BY HEBER W YOUNGKEN <sup>1</sup>

The steady increase in the employment of powdered desiccated endocrine glands within recent years in the treatment of diseases resulting from a deficiency in or an unbalanced condition of the internal secretions has resulted in a greatly increased production of these products and the consequent need of biological and microscopical methods of valuation for them

It has become evident that biological assays alone would not entirely satisfy the purity nor the identity standards of these materials and that without microscopic descriptions of them, they would be prone to adulteration with undesirable organic cellular materials by unscrupulous persons

In December 1933, the author published the results of some preliminary studies made upon the microscopy of a number of these glandular products Since that time additional desiccated endocrine glands and their powders have been studied by the writer It is the purpose of this paper to outline the results of these studies upon powdered desiccated suprarenal and powdered desiccated thyroid glands

## MATERIALS AND METHODS

The glandular products examined consisted of preserved and desiccated suprarenal and thyroid glands of cattle and hogs, powdered desiccated suprarenal glands of cattle and hogs, and the powdered, desiccated thyroid glands of cattle, sheep and hogs Some of the glands were imbedded in celloidin, stained with Delafield's hematoxylin and studied under the compound microscope in comparison with figures and descriptions in recognized texts on animal histology for the purpose of establishing the relationship of regions and tissues

The desiccated glands were macerated in water and these and the preserved glands were then dissected and representative regions teased apart and examined under the microscope separately in water and in other temporary mounts with various reagents and stains The histological elements observed in them were compared with similarly stained and mounted materials of the powdered desiccated glands

The reagents and stains employed were the following Delafield's hematoxylin, Mallory's stain, equal parts of Mallory's stain and 1% phosphotungstic acid solution, chromic acid T S, hematoxylin and eosin, alcoholic eosin and water

It was found necessary to dilute the hematoxylin stains with water, especially when the fragments were large, in order to make out the cellular regions clearly It was also found good practice to mount small portions of the powders, distributing their fragments as uniformly as possible in the mounting medium beneath the cover slip Alike with these and other powdered endocrine products previously discussed, it is frequently necessary to examine a number of mounts to find the less numerous histological elements of the gland This is owing to the finely comminuted and altered state of some of the histological elements

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\* Scientific Section, A P H A, Portland meeting, 1935

<sup>1</sup> Massachusetts College of Pharmacy, Boston, June 1, 1935

## THE THYROID GLAND

The thyroid body is a ductless, compound tubular gland, and consists of two large almond-shaped lateral lobes united by a narrow bank, the middle lobe, or isthmus and forming a projection on the ventral surface of the trachea

This gland is surrounded by a capsule of dense white fibrous tissue that sends in trabeculae, which divide the gland into lobes and lobules. These divisions are irregular, and the lobules are composed of a number of short tubules, sometimes called follicles, that vary considerably in diameter. Each tubule is lined by cuboidal epithelial cells that rest upon a basement membrane, outside of this is the intralobular, or intertubular, connective tissue that supports the blood vessels. The cells are of two kinds, namely, the chief cells and the colloid cells. The chief cells are said to become the colloid cells, and these in turn change into the colloid substance that is supposedly the result of the activity of the cells. It has a yellowish color,

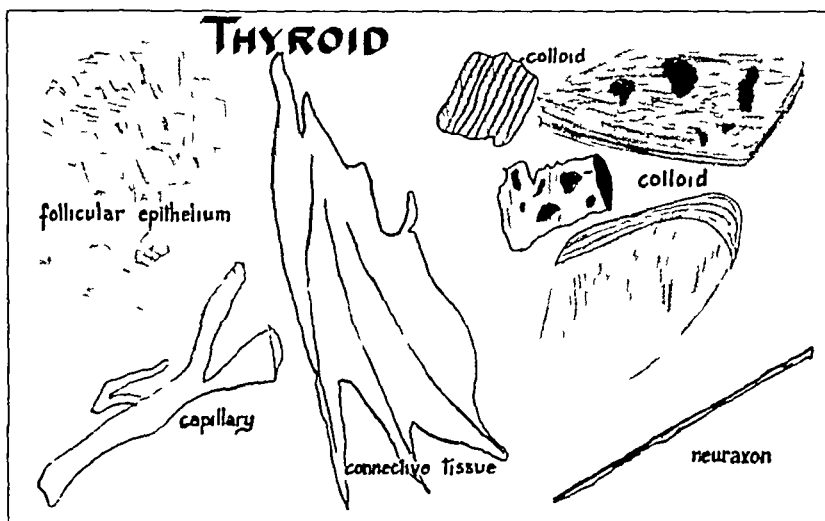


Fig 1 —Histological elements found in Powdered Desiccated Thyroid

and as blood cells are frequently seen in it, the color may be due to the hemoglobin from these. Sometimes the colloid material is shrunken, and then its edges are crenated, in such tubules, the epithelial cells are drawn away from the basement membrane. Blood vessels are numerous, and dense plexuses are formed around the tubules. It is thought that the colloid substance may represent an internal secretion that is absorbed by the blood vessels, or perhaps by lymphatics. The lymphatics are numerous, and lie between the tubules. They often contain some of the colloid substance.

The lobes of the thyroid are separately removed from the recently slain animal deprived of enveloping connective tissue and fat, sliced or minced and rapidly dried in a current of warm air. They are then reduced to a coarse powder which is treated with petroleum ether for the partial removal of fatty matter present. The powder is then dried in a desiccator. The final product should be a yellowish or buff-colored amorphous powder having a slight, characteristic, meat-like odor and saline taste.

## POWDERED DESICCATED THYROID

When suitably mounted and examined under the microscope, it shows numerous smooth to striated, hyaline fragments of colloid, of angular to irregular shape which are colorless to pale yellow in water mounts, brown in Mallory's stain and pink in eosin solution, some of these fragments containing granules, minute vacuoles, crystalloidal bodies and cells, numerous irregular fragments of follicular epithelium staining brown or orange-brown with Mallory's stain, the individual cells more or less polygonal to rounded-angular or irregularly cuboidal, often with prominent nuclei staining dark blue, their cytoplasm purplish with Delafield's hematoxylin slender glistening segments of neuraxons, numerous aggregates of particles of intercellular substance and slender, mostly straight, connective tissue fibres staining blue to greenish blue with a mixture of Mallory's stain and 1 per cent solution of phosphotungstic acid, the bundles of fibres often appearing reddish in plain Mallory's stain, few glistening fragments of blood vessels with serrated or crenated ends as viewed in water mounts

## THE SUPRARENAL GLANDS

The suprarenal or adrenal glands are more or less pyramidal shaped ductless glands, one being situated on the upper pole of each of the kidneys Each gland

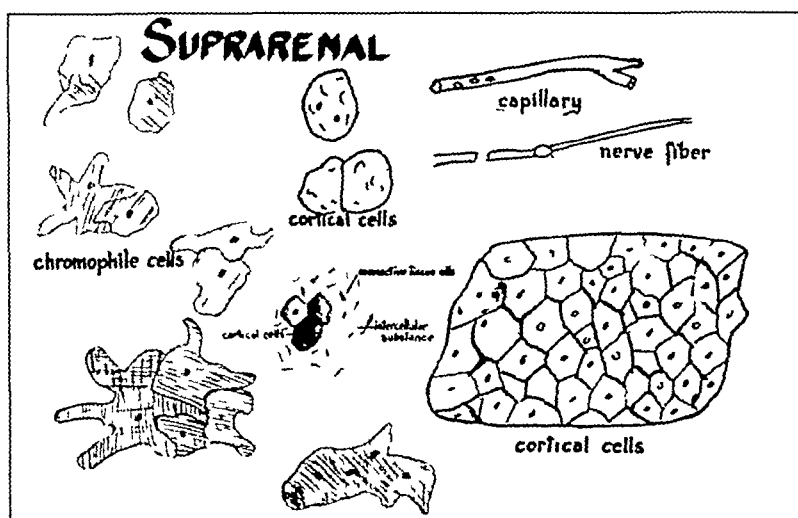


Fig 2 —Histological elements found in Powdered Desiccated Suprarenal

is surrounded by a thin capsule of white fibrous connective tissue and presents for examination two regions, the cortex and the medulla

The cortex or outer firmer region is yellowish in appearance and when examined microscopically consists of a delicate framework of connective tissue in the meshes of which lie solid columns of epithelial cells. It is subdivided into three zones known in order from without inward as the zona glomerulosa, the zona fasciculata and the zona reticularis. The cells of the zona glomerulosa are mostly large and polyhedral and contain many lipid granules. In cross sections they appear in irregularly circular to oval groups. The columns of cells are surrounded by a reticu-



lum of connective tissue containing capillaries and nerve fibres The zona fascicula consists also of epithelial columns arranged in radial groups which are surrounded by connective tissue containing capillaries and nerve fibres The epithelial cells of this zone appeared to be larger than those of the other cortical zones and contained lipid granules The zona reticularis is composed of a network of small polyhedral epithelial cells with large nuclei and pigmented cytoplasm It is the darkest tinted of the three zones of the cortex

The medulla comprises the central portion of the gland It is soft in texture and brown in color It consists of numerous polygonal to somewhat lobed and stellate, chromophil or chromaffin cells arranged in irregular groups and anastomosing cords that are surrounded by connective tissue containing blood vessels, blood sinuses, capillaries, nerve fibres and ganglion cells The chromaffin cells contain material which stains brown with solutions of chromic acid or its salts

In the preparation of the powdered desiccated drug, the glands are obtained from freshly killed cattle, sheep and hogs, deprived of surrounding connective tissue and fat, sliced or minced and rapidly dried in a current of warm air They are then reduced to a coarse powder, in some places partially defatted, and dried *in vacuo* at a temperature below 60° C or by means of a dehydration solvent like acetone

#### POWDERED DESICCATED SUPRARENAL

The powders examined were light yellow to brown and possessed a slight characteristic odor They were only partially soluble in water

Under the microscope the following histological elements were observed Numerous chromaffin (chromophil) cells, both isolated and in loose aggregates, the individual cells stellate to irregular with spheroidal to oval nuclei and granular cytoplasm which took a brownish coloration with chromic acid T S, numerous clear, jointed segments of non-medullated nerve fibres, the axons of which are colored mauve with hematoxylin and eosin T S, numerous cortical cells both isolated and in masses, the individual cells cuboidal to irregularly rounded or rounded polyhedral, with spheroidal nuclei, some of the cells containing tiny fat globules, granules or pigment, the chromatin of the nucleus and granules staining blue and the protoplasm red to purple with Delafield's hematoxylin and alcoholic eosin, numerous fragments of connective tissue fibres, fibrocytes and particles of intercellular substance, the fibres wavy, the fibrocytes slender, linear to fusiform, and all colored blue with a mixture of Mallory's stain and a 1% solution of phosphotungstic acid, numerous minute granules of crystalline appearance and irregular form and many isolated nuclei

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George Washington University School of Medicine has announced the addition to the faculty of the newly established course in public health teaching of Drs George W McCoy, Rolla E Dyer Edward Francis Charles Armstrong and Robert Olesen all of the U S Public Health Service with the title of professorial lecturer in preventive medicine The appointment of Ralph W Harris Ph D as assistant professor of anatomy at the school of medicine, was also announced

THE CONSTITUENTS IN CASCARA SAGRADA EXTRACT 2 A  
METHOD OF BIOASSAY \*<sup>1</sup>BY MELVIN W GREEN, C G KING AND GEORGE D BEAL <sup>2</sup>

Cascara sagrada, the dried bark of the trunk and branches of *Rhamnus Purshiana* (De Candolle), has been studied in many laboratories with the hope of disclosing the chemical nature of its active ingredients. Due to the predominance of methyl anthraquinones, the bark extracts have been classified as anthracene, anthraquinone or emodin cathartics. Jowett (1) has identified emodin and isoemodin (trihydroxymethyl anthraquinones) as free aglycones, in addition to rhaminol, a sterol melting at 135-136°, syringic acid, pyrocatechuic acid, and several common fatty acids. Beal and Tumminikatti (2), Daels (3) and others have shown that the anthraquinones present may be either free or combined. Sipple, King and Beal (4) have reported the isolation of a rhamnoside yielding emodin and rhamnose upon hydrolysis. No definite quantitative correlation has been established between any chemical unit and cathartic activity, however.

There have been many attempts to assay cathartics physiologically, but no method has come into general use. White mice, dogs, cats and men have been used for this purpose, according to Munch (5), the results being expressed in terms of the minimum dosage required to produce catharsis. Sipple, King and Beal (4) found their rhamnoside to be inactive when administered orally to white mice in doses equivalent to 3 Gm of bark, and pure emodin was inactive in doses of 5, 10 and 20 mg. Gruber, Bryan and Richardson (6), using non-anesthetized dogs, placed a rubber balloon in the lumen of the gut and recorded the effect of various drugs upon the general tonus and contractions of the intestine. Meissner (7) and several others have tried the effect of various drugs, including senna and frangula, on isolated portions of the intestine. In our opinion, however, the latter two methods do not express the total physiological activity, because they do not take into consideration such phenomena as swelling, hydration and absorption, or the effect of irritation and stimulation in different areas of the intestinal tract. Munch (5) apparently obtained the best results with cats, but claimed an accuracy of only 20 to 50%.

This study was undertaken to establish a means of assay sufficiently accurate that we might obtain further information regarding the value of various fractions of cascara sagrada extract.

## EXPERIMENTAL

## I CHEMICAL FRACTIONATION

A method for the fractionation of the bark extract similar to that of Sipple, King and Beal (4) was employed. 300 Gm of bark was extracted with ethyl acetate yielding a water- and alcohol insoluble highly colored resinous mass which was designated as Fraction A. The marc was then divided into two portions B and C. Portion B was first extracted with alcohol yielding fraction B<sub>1</sub> and its marc further extracted with acetone yielding B<sub>2</sub>. In the case of portion C the

\* The authors are indebted to the Parke, Davis and Company for a research grant (for M W G) and for supplying the cascara bark.

<sup>1</sup> Contribution No 307 from the Department of Chemistry, University of Pittsburgh

<sup>2</sup> Assistant Director, Mellon Institute of Industrial Research

procedure was reversed & it was first extracted with acetone yielding C<sub>1</sub> and the marc later extracted with alcohol yielding C. These B and C extractives were again divided into sub-fractions based upon lead acetate precipitations and solubility in organic solvents without identification of individual ingredients

## 2 ANIMAL ASSAY

**Assay of Fluidextract**—An attempt was made to use both guinea pigs and white rats to measure the degree of catharsis. The animals kept in individual cages were fed a Sherman La Mer and Campbell (8) diet *ad libitum*, supplemented in the case of guinea pigs with orange juice or spinach for vitamin C. Twenty four hours before the beginning of the test period they were transferred to raised-bottom cages adapted for the collection of feces. The guinea pigs weighed from 300 to 500 Gm. Above this they were too irregular in response for satisfactory use.

The degree of catharsis was determined by the rate of fecal output (Gm. per hour) the feces being collected and weighed every three hours. In order to detect any abnormal rate in the fecal output before the beginning of the assay period the animals were kept under observation for at least 6 hours before the cascara was given and then adjusted into groups as nearly balanced

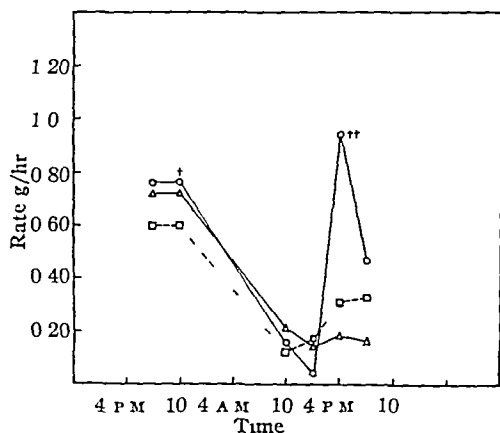


Fig 1—Assay of fluidextract with guinea pigs using single dosage

○—2.0 Gm dosage  
△—1.0 Gm dosage  
□—control

+—cascara given  
++—liquefaction

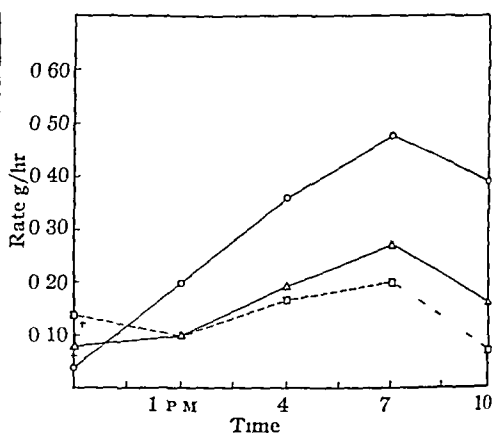


Fig 2—Assay of fluidextract with guinea pigs using two separate doses

○—total of 1.0 Gm dosage  
△—total of 0.5 Gm dosage  
□—control  
+—2nd dose of cascara given

as possible. When the test proper was begun food cups were removed to avoid the influence of differences of food intake. The cascara was administered by pipette in the form of fluidextract U S P X in doses of 1 and 2 cc. equivalent to 1 and 2 Gm of original bark. Control animals were given 2 cc. of water by pipette, thus eliminating any difference due to handling of the animals. A period of at least one week was allowed between experiments to permit the animals to readjust themselves to normal.

For about twelve hours after the cascara was given during which there was no food intake there was a very slow fecal output clearly subnormal followed by an increase and occasionally a degree of liquefaction which continued through 18 or 21 hours after the time of dosage. Below is a typical curve (Fig 1) showing the effect of the fluidextract on a group of 15 guinea pigs (5 on each level). In many cases liquefaction occurred when there was not such a steep rise in the curve as indicated by the highest point for the 2 Gm. group.

Figure 2 shows an average effect on guinea pigs taken from four independent determinations. The animals were given doses equivalent to 0.5 or 1.0 Gm of bark in divided doses. The first dose was given at 10 P M and the second at 10 A M the following day (each dosage level represents 16 animals).

The response of the white rat was not so uniform as that of the guinea pig when the same procedure was employed. The fluidextract was fed in doses equivalent to 50 and 100 mg of bark.

A preliminary observation of 24 hours preceded the actual test period. After the administration of cascara, the animals were observed during an assay period of 24 hours. During the pre-test period, the rate fluctuation was similar to that of the control group during the assay. An average rate of 0.06 Gm. per hour was followed by a maximum of 0.32 Gm. per hour on the higher level. This curve (Fig. 3), with five animals on each level, is the best one we have obtained with rats. For the most part, the rat assays were less satisfactory than was indicated by this curve.

In the case recorded in Fig. 2 the average total fecal output during the active period of catharsis (4 P. M. to 10 P. M.) was determined and compared with the total output for each animal. The probable errors were calculated from this information (Table I). The probable error of the

TABLE I—DEGREE OF VARIATION IN BIOLOGICAL ASSAY

Test Level (Fig. 2)	Total Wt. of Feces Gm. (4 P. M.—10 P. M.)	Probable Error
High dosage level (1.0 Gm.)	1.16	0.14
Low dosage level (0.5 Gm.)	0.55	0.06
Control	0.41	0.08

difference between the means of the high and low dosage level was found to be 0.15, while the difference between these means was 0.61. If this difference between the means had been the same as the probable error of the difference, then the chances would have been even that the difference in the rate of fecal output on the two levels was a real one. But, since the ratio of the difference between the means to the probable error of difference is approximately 4 to 1, the chances are about 142 to 1 that this difference is real. The ratio of the difference between the means of the low level and controls to the probable error of this difference is 1.4, which means that the chances for this difference being real is slightly less than 4 to 1.

*Assay of Fractions*—Typical fractions from the above scheme of separation were assayed by the method just described. Liquefaction did not occur so regularly as with the whole bark extract, nor was the fecal output increased by an equivalent dosage of the various fractions. In doses equivalent to 2 Gm. of bark, the products corresponding to  $B_1$  and  $C_1$  were both active, but less so than the fluidextract. The water insoluble fraction A was also active, but less so than either water soluble  $B_1$  or the fluidextract.

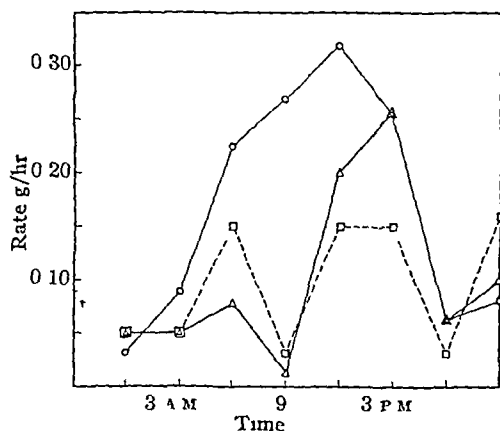


Fig. 3—Assay of fluidextract with white rats  
 ○—100 mg dosage      □—control  
 △—50 mg dosage      +—cascara given

## DISCUSSION

Although the method of assay is not sharply quantitative, it is sufficiently accurate with guinea pigs to interpret the results of feeding various fractions of the bark or pure compounds. An average result from several different determinations gives a relatively smooth curve. With the present technique, the white rat is too undependable, however, for this type of assay.

On the basis of the work done so far on the feeding of fractions, it appears that no one fraction is responsible for the full activity characteristic of the whole-bark extracts. This may be due in part to a solubility effect, as suggested by Poulsen (9), but we are inclined to think that the effect is due to the combined influence of the many substances present. Although it is generally conceded that cascara

acts chiefly on the colon, there is probably some influence on the small gut, so that the total activity is due to the synergetic effect of the various constituents acting all along the tract. It was noticed, in the case of the water-insoluble fraction A, that the higher doses (2-10 Gm equivalents) caused the urine to be colored a deep red dish yellow, characteristic of the anthraquinones. Apparently a large part of the originally insoluble material entered the circulation and was rapidly excreted by the kidneys.

#### SUMMARY

(1) A method of making physiological assays of the cathartic value of *cascara sagrada* has been described, based upon the use of young, growing guinea pigs as experimental animals.

(2) The study of various fractions prepared from *cascara sagrada*, based primarily upon differences in solubility in water, alcohol, ethyl acetate and acetone, indicates that the activity is widely distributed between the various fractions and probably is dependent upon several types of substances. Hence, specific chemical tests and irritability tests on isolated muscle are likely to be misleading in terms of cathartic value.

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#### DRUG EXTRACTION VII THE EFFECT OF METHOD OF PACKING ON EFFICIENCY OF PERCOLATION \*<sup>1</sup>

BY WILLIAM J HUSA<sup>2</sup> AND C L HUYNH

In packing drugs in percolators, the choice of a method is governed largely by the scale of operations. In packing a 1000 or 5000 gallon percolator the weight of the drug is usually depended upon to produce as much packing as is needed. In packing a quart or half-gallon percolator the most generally used method has been to transfer all of the moistened drug to the percolator and apply pressure to the top by means of an ordinary wooden potato masher or a large cork fitted with a handle, thus securing greater packing in the upper portion of the drug.

\* Scientific Section A Ph A, Portland meeting 1935

<sup>1</sup> This investigation was aided by a grant from the AMERICAN PHARMACEUTICAL ASSOCIATION Research Fund    <sup>2</sup> Head Professor of Pharmacy University of Florida

An experiment was carried out to determine what effect a difference in method of packing would have on the efficiency of percolation, since no data on this point could be found in the literature

#### EXPERIMENTAL PART

An experiment was carried out in which two methods of packing were compared under two different conditions of percolation, *i e*, (a) slow percolation with maceration both before and after packing, and (b) fast percolation with no maceration whatever. In the method of packing designated as "from top," the moistened drug was introduced into the percolator in small portions with slight agitation of the percolator to promote even distribution, and after all the drug had been thus introduced it was packed down from the top, using a wooden potato masher and starting with light pressure which was gradually increased. In the method of packing designated as "in sections," the drug was introduced in about eight portions and each separate portion packed down. As indicated in Table I, the method of packing in sections gave tighter packing as evidenced by the smaller volume of the packed drug.

The drug used was belladonna root in No. 40 powder. The menstruum was a mixture of 5 volumes of alcohol and 1 volume of water.

Four portions of drug of 800 Gm each were percolated, each portion being moistened with 480 cc of menstruum. The following percolates were collected from each percolator: reserve I, 320 cc, reserve II, 320 cc, weak percolate, 320 cc. The sum of reserves I and II corresponds to 800 cc of reserve percolate for 1000 Gm of drug. The reserve portion was collected in two fractions in order to throw more light on the course of the extraction.

TABLE I—EXPERIMENTAL DETAILS

Percolator	Method of Packing	Hours of Maceration Before Packing	Hours of Maceration After Packing	Rate of Flow in Drops per Minute		Volume of Packed Drug in Cc
				Reserves I and II	Weak Percolate	
I	In sections	6	48	10	20	1490
II	From top	6	48	10	20	1750
III	In sections	0	0	20	40	1500
IV	From top	0	0	20	40	1725

TABLE II—ASSAY RESULTS

	Gm Total Alkaloids				Gm Total Extractive			
	Per colator I	Per colator II	Per colator III	Per colator IV	Per colator I	Per colator II	Per colator III	Per colator IV
Reserve I	1.67	1.80	1.75	1.71	26.9	26.4	26.3	25.5
Reserve II	1.79	1.81	1.37	1.60	24.5	25.2	24.0	24.3
Weak percolate	0.31	0.16	0.42	0.24	19.2	19.7	19.9	20.6
Total	3.77	3.77	3.54	3.55	70.6	71.3	70.2	70.4

The effect of packing may be seen by the comparison given in Table III.

TABLE III ASSAY RESULTS IN RESERVE PORTION

	Gm Total Alkaloids in Reserves I and II as a Whole	Gm Total Alkaloids in Reserves I and II as a Whole
	Packed in Sections	Packed from Top
Slow percolation	3.46	3.61
Fast percolation	3.12	3.55

## DISCUSSION OF RESULTS

The results thus far obtained indicate that packing from the top is somewhat better than packing in sections. When the drug is packed from the top more of the alkaloid is in the reserve and less in the weak percolate than when packed in sections. As far as present results are concerned, the method of packing has no appreciable effect on the rate of extraction of total extractive.

When maceration both before and after packing was omitted and the rate of flow doubled, the extraction of alkaloids was slower but there was no appreciable effect on the efficiency of extraction of total extractive.

## SUMMARY

By percolation experiments using 800-Gm portions of belladonna root it has been found that extraction of alkaloids is more efficient when all the drug is placed in the percolator and packed from the top than when the drug is introduced in the percolator in portions and each portion packed before the next is added. The method of packing has no appreciable effect on the efficiency of extraction of total extractive. When maceration before and after packing is omitted and the rate of percolation is doubled the extraction of alkaloids is slower but there is no appreciable effect on the efficiency of extraction of total extractive.

## SOME MERCURIATED DERIVATIVES OF THYMOL AND CARVACROL \*

BY JOSEPH B. BURT <sup>1</sup>

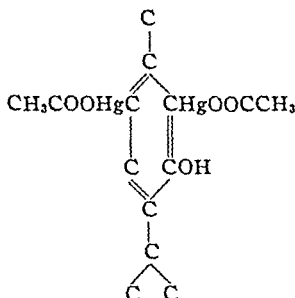
According to the anonymous author (1) of a paper on mercury compounds of the aromatic series, a number of such derivatives of mercury have been suggested for use as antisypilitics. Among others, "Thymol Mercury" was suggested by Bambelon in 1888. This preparation was described as a basic salt having a violet green color, which was regarded as unsuitable for therapeutic use because of its lack of stability. The author also mentions a series of thymol mercury derivatives of a different type prepared by E. Merck, which were thought to be double salts containing an organic or inorganic acid radical as a constituent of the molecule. Three examples of such compounds are listed by Merck (2), *viz*, mercuric thymol acetate, mercuric thymol nitrate and mercuric thymol sulphate. The only one of these for which a definite formula is given is thymol mercuric acetate, which is shown as  $\text{Hg}(\text{CH}_3\text{COO})_2 \cdot \text{Hg}(\text{CH}_3\text{COO} \cdot \text{C}_{10}\text{H}_{13}\text{O})$ . In addition, Merck also lists mercuric thymol salicylate as well as mercury thymolate, probably the same as the "Thymol Mercury" previously mentioned. The latter is described as a "basic salt of variable composition, but usually  $\text{HgC}_{10}\text{H}_{13}\text{OH}$ " (sic), "a reddish yellow powder, insoluble in water."

Another reference to mercury derivatives of thymol is the report of Dimroth (3) on the formation of chlormercuri thymol,  $\text{C}_6\text{H}_2(\text{CH}_3) \cdot (\text{C}_3\text{H}_7)\text{OH} \cdot \text{HgCl}$ , and diacetoxymercuri thymol,  $\text{C}_6\text{H}(\text{CH}_3)(\text{C}_3\text{H}_7)\text{OH} \cdot (\text{HgOCOCH}_3)_2$ . The author does not indicate the positions of the substituted groups, but the formulas indicate that he

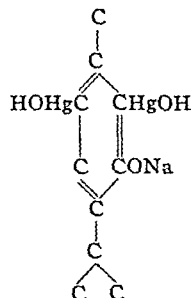
\* Scientific Section A. Portland meeting 1935.

<sup>1</sup> College of Pharmacy, University of Nebraska.

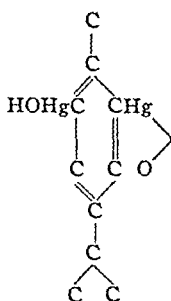
considers the hydrogens of the nucleus replaced, rather than the phenol hydrogen Whitmore (4), in his review of Dimroth's report, suggests that the first compound may be considered as the para derivative, for he assigns to it the name (p 112)-chlor-mercuri thymol. He calls the second compound diacetoxymercuri thymol, without suggesting the possible positions of the substituted groups



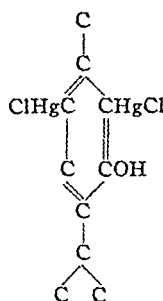
2,6 Diacetoxymercuri thymol  
Thymolquecksilberacetat (Rupp)



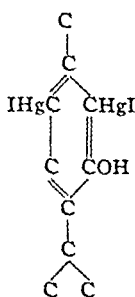
Sodium 2,6 dihydroxy-  
mercuri thymolate  
Dimercurihydroxy-  
Thymolnatrium (Rupp)



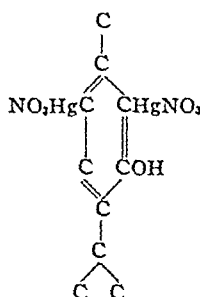
Mono anhydride of  
2,6 dihydroxymercuri  
thymol  
Monoanhydridodimercuri  
hydroxy-Thymol (Rupp)



2,6 dichloromercuri  
thymol  
Dimercurichlorid  
Thymol (Rupp)



2,6 diiodomercuri thymol  
Dimercuriiodid Thymol (Rupp)



2,6 dinitratomercuri thymol  
Dimercurnitrat-Thymol (Rupp)



A more comprehensive study of the mercury derivatives of thymol is that of Rupp (5), a publication that appears to have been omitted in Whitmore's compilation. Rupp confined his study to the di-mercuric derivatives of thymol, and reported the preparation of six compounds, the compositions of which were determined by analysis, and he also established the position of the substituted hydrogens as 2, 6. The compounds which he obtained are shown on page 113.

Rupp's results are not in accord with the earlier view that the diacetoxymercuri thymol could be obtained in the form of the sodium thymolate by dissolving in sodium hydroxide solution and crystallizing from this solution, for they indicate that the product resulting from this treatment is the sodium dihydroxymercuri thymolate instead of the sodium diacetoxymercuri thymolate. He also points out the fact that these compounds, by dissolving in solutions of fixed alkalis, preclude the possibility of a double salt containing one molecule of mercuric acetate associated with one molecule of the substituted thymol, as suggested by Merck, since in this case the alkali would precipitate mercuric oxide instead of forming a solution.

The fact that these compounds retain their phenolic character and at the same time contain a rather high percentage of mercury suggests that they may be of some importance as antiseptics and fungicides. Inasmuch as carvacrol, the phenol isomeric with thymol, has recently been employed in the treatment of dermatophytosis, and no report of the application of the reaction of mercuric salts to carvacrol has been found in the literature, it seemed desirable to investigate this possibility. Accordingly, a study of these products has been undertaken, which is still in progress. This discussion represents but a preliminary report on a few derivatives of carvacrol which have been obtained thus far.

#### EXPERIMENTAL

*Mono chlormercuri Carvacrol and Di-chlormercuri Carvacrol*—Thirty grams (30.72 cc., one mol.) of carvacrol, obtained from the volatile oil of *Monarda pectinata*, Nutt., were dissolved in alcohol and boiled, under a reflux condenser, with an alcoholic solution of 63.66 Gm. (one mol.) of mercuric acetate, to which 12 cc. of glacial acetic acid had been added, for about three hours. Upon cooling and standing a few hours, a bulky deposit of needle-shaped crystals was formed, apparently the acetoxymercuri carvacrol. This compound was not isolated, but the reaction mixture was again heated, whereupon the crystalline material dissolved, except for slight traces of flocculent material (not needle-shaped crystals) which were removed by filtering while hot. The solution was then poured with stirring into an aqueous saturated solution of sodium chloride, precipitating the chlormercuri carvacrol. This was filtered out with suction, washed with water and dried. The weight was 62.0 Gm., corresponding to a yield of 80.72 per cent of the theoretical, based upon the mono derivative. The substance was found to be, however, a mixture of the mono- and the di-derivatives.

Thirty-six and one-half grams of the crude product were recrystallized from hot 50 per cent alcohol. After repeated extraction, a white residue remained, which was insoluble in the solvent, and which appeared to be much heavier than the main portion of the product. After drying, the insoluble portion weighed 3.95 Gm. After hydrolysis by boiling with dilute hydrochloric acid (yielding carvacrol and mercuric chloride), the mercury was determined by precipitation as sulphide. Two

samples gave 64.58 and 64.62 per cent, respectively, of mercury. The calculated percentage of mercury in di-chloromercuri carvacrol,  $C_{10}H_{12}OHg_2Cl_2$ , is 64.69 per cent. The compound decomposes with partial fusion at 207–208° C. It gives a positive test for halogens when heated on a copper wire. It is a fine powder, characterized by the tenacity with which it adheres to every surface with which it comes in contact, and appears to become electrified upon rubbing.

The hot 50 per cent alcoholic solution was allowed to cool, and the material which separated (18.2 Gm.) was filtered out. A second crop (8.75 Gm.) was obtained by partial spontaneous evaporation of the mother liquor.

The first crop (18.2 Gm.) was again recrystallized from hot 50 per cent alcohol, in which it was completely soluble. Two crops were obtained as before. These were combined and again recrystallized from the same solvent. Two crops (6.80 Gm. upon cooling, and 7.20 Gm. upon partial evaporation) were obtained. A sample of the first crop appeared to decompose without complete fusion at 163–164° C. When assayed for mercury after hydrolysis with dilute hydrochloric acid, by precipitation as sulphide, two samples gave 52.73 and 52.83 per cent, respectively, of mercury. The calculated value for monochloromercuri carvacrol is 52.08 per cent of mercury. Thus it appears that the product, after three recrystallizations from hot 50 per cent alcohol, is still contaminated with traces of the di-derivative.

The somewhat impure mono-chloromercuri carvacrol is very soluble in acetone, and in dioxan, from both of which it may be reprecipitated by pouring into water. It is difficultly soluble in alcohol, ether and chloroform, and practically insoluble in petroleum ether and water. A solution in acetone, another in dioxan and a suspension in water, all gave, upon continued treatment with hydrogen sulphide, precipitates of mercuric sulphide, but somewhat less promptly than if previously hydrolyzed. A saturated chloroformic solution, when boiled with solid sodium hydroxide, failed to give a Flueckiger test, indicating the absence of free carvacrol. The substance is finely crystalline, appearing under the microscope as long needles. The second crop formed larger needles, visible to the naked eye. When heated on a copper wire, a positive test for halogens is given. The compound dissolves readily in 5 per cent solution of sodium hydroxide, probably forming the sodium mono-hydroxymercuri carvacrolate. If the solution is acidified with dilute hydrochloric acid, the original mono-chloromercuri carvacrol is reprecipitated. If, however, the alkaline solution is treated with carbon dioxide, a bulky white precipitate is slowly formed, which is, without doubt, the mono-hydroxymercuri carvacrol. This product has not, as yet, been examined.

*Mono acetoxymercuri Carvacrol*—Equimolecular portions of carvacrol and mercuric acetate (30 Gm. carvacrol, 63.66 Gm. mercuric acetate) were boiled together in alcoholic solution containing 12 cc. of glacial acetic acid, under a reflux condenser, for three hours. The hot reaction mixture was filtered free from a trace of flocculent material which was formed, and, upon cooling, a mass of needle shaped crystals was deposited. These were filtered out and additional crops were obtained from the alcoholic mother liquor by fractional crystallization. Four crops were obtained, weighing 31.5 Gm., 9.95 Gm., 8.50 Gm. and 10.10 Gm., or a total of 60.05 Gm., corresponding to a yield of 73.59 per cent of the theoretical, based upon the mono derivative. Three samples of the first crop, without further purification,

gave, upon hydrolysis and precipitation as mercuric sulphide, 49.66, 49.75 and 49.76 per cent, respectively, of mercury. The calculated percentage of mercury for the mono-acetoxymercuri carvacrol is 49.08 per cent. It is evident that the first crop is somewhat impure, being contaminated with traces of the di-acetoxymercuri carvacrol. A sample of the first fraction partially fused and decomposed, rising out of the melting-point tube due to gas formation, at 173–174° C.

*Mono-chlormercuri Thymol Methyl Ether*—The ease with which the mono-chlormercuri carvacrol and the mono-acetoxymercuri carvacrol dissolve in fixed alkali indicates that the phenol hydrogen is not involved in the reaction. Accordingly, the methyl ether of thymol or of carvacrol should react with mercuric acetate. This reaction was carried out on the methyl ether of thymol on a small scale, the product being precipitated by pouring the alcoholic solution into an aqueous solution of sodium chloride. A grayish white product, appearing almost white when dry, was obtained in a quantity corresponding to a yield of 90.87 per cent, based upon the mono derivative. Although equimolecular proportions were used, it is probable that the product is a mixture of the mono- and di-derivatives, with the mono-derivative predominating. No attempt has been made to separate the compounds, nor has it been analyzed for mercury. It gives a positive test for halogens, and a precipitate of mercuric sulphide upon suspending in water and treating with hydrogen sulphide. It is fairly soluble in acetone and dioxan, somewhat less soluble in ether and glacial acetic acid, difficultly soluble in chloroform and alcohol and practically insoluble in petroleum ether. It is insoluble in a 5 per cent solution of sodium hydroxide, even upon boiling, but turns somewhat grayish under this treatment.

*Mono-chlormercuri Carvacrol Methyl Ether*—In a procedure similar to that followed in the reaction with the methyl ether of thymol, the methyl ether of carvacrol yielded a product corresponding to 83.34 per cent of the theoretical, calculated for the mono-derivative. This product was also grayish white in appearance, being somewhat darker when moist. It also gave a positive test for halogens, and is acted upon, in aqueous suspension, by hydrogen sulphide to form mercuric sulphide. It has properties similar to those of the corresponding derivative of the methyl ether of thymol, except that it is relatively more soluble in glacial acetic acid, and notably less soluble in acetone. It is likewise insoluble in a 5 per cent solution of sodium hydroxide.

#### SUMMARY AND DISCUSSION

A preliminary study, chiefly of the mono mercuri derivatives of carvacrol, has been made. The following compounds have been prepared: mono-chlormercuri carvacrol, di-chlormercuri carvacrol, mono-acetoxymercuri carvacrol, mono-chlormercuri thymol methyl ether and mono-chlormercuri carvacrol methyl ether. The mono derivatives of carvacrol dissolve readily in dilute alkalis to form the corresponding phenolates, which may be obtained by crystallization from the solution, or precipitated in the form of the mono-hydroxymercuri carvacrol by treatment of the alkaline solution with carbon dioxide. Although equimolecular proportions of carvacrol and mercuric acetate were used, the product of the reaction is a mixture of the mono- and di-derivative, in which the mono-derivative predominates.

Ten per cent ointments of the mono-chlormercuri carvacrol and of the mono-acetoxymercuri carvacrol have been prepared and submitted to Dr R L McIntosh, of the State of Wisconsin General Hospital, who has kindly agreed to conduct a series of laboratory and clinical tests of their fungicidal properties

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### A TOXICOLOGICAL STUDY OF THE CUTANEOUS SECRETIONS OF THE SALAMANDER, *TRITURUS TOROSUS* (RATHKE) \*

BY ERNST T STUHR <sup>1</sup>

#### INTRODUCTION

Interest in the secretions and excretions of various animals has been long manifested. The literature records numerous references to the poisonous skin secretions of toads (1, 2, 3), reptile venoms (4), spider bites (5, 6), insect bites and stings. Noble (7) has indicated that the secretion of the skin glands of certain salamanders is potent, particularly the secretion from the granular glands, due to several alkaloidal-like principles, and that the virulence of the poison differs with the species of salamander.

The toxic properties of an aqueous solution of the granular gland secretions of the salamander is here considered.

#### THE GLANDULAR SECRETIONS

The western newt, *Triturus torosus* (Rathke), is a common species of salamander in the Oregon country. Profuse cutaneous excretion occurs during the breeding (mating) season, March-April. The glands can be stimulated by subjecting the animals to crowded quarters or by partial suffocation. The secretion may then be secured by washing the salamanders. The granular cell product is transparent, while the mucous cell product is turbid, possibly indicating partial oxidation and insolubility. The two secretions can be separated by decantation or by the use of a separatory funnel.

#### ACUTE TOXICITY

Hypodermic injections (subcutaneously or intraperitoneally) caused animals (frogs, cats, rabbits, guinea-pigs and dogs) to rapidly develop toxic symptoms and

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\* Scientific Section A PH A Portland meeting 1935

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effects of general depression, muscular incoordination, respiratory irregularities, followed by death due to respiratory failure, with the heart continuing to beat for several minutes after respiratory paralysis. The higher animals developed nausea and vomiting, indicating medullary disturbances.

#### GENERAL PHYSIOLOGICAL CONSIDERATION

##### *Local Action*

**Subjective** Benumbing sensation to the hands and skin contacted, indicating paralysis of the sensory nerve endings.

**On frog** A normal frog was immersed and allowed to rest in a bath of the aqueous solution of the salamander secretion. The frog became sluggish in responding to ordinary stimuli; the secretion solution apparently acting as a local anesthetic.

##### *Circulatory and Respiratory Response*

**On frog**

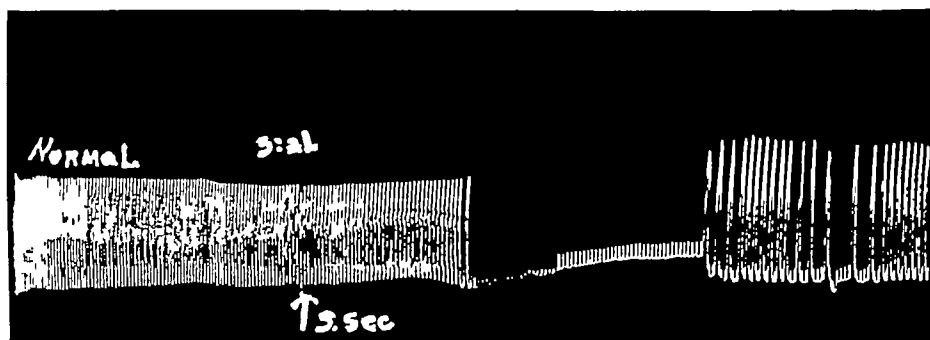


Fig 1

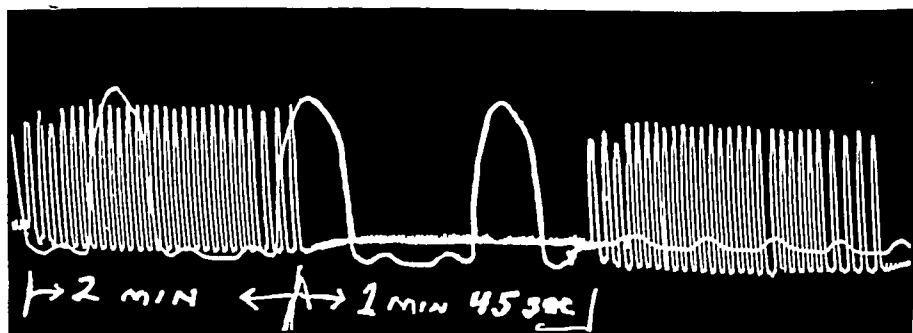


Fig 2

Fig 1 and Fig 2—Cardiograms of salamander secretion on frog's heart

**Procedure** Frog pithed; heart exposed and perfused with salamander secretion in aqueous solution.

**Effects** Progressive decrease in tone (amplitude) of contraction accompanied in most instances by dilatation. Continued perfusion has a depressive effect with periods of ventricular standstill of approximately two-minute intervals followed by increased tone and decreased heart rate; the auricles beating at a faster rate than the ventricle. Pulsus alternans predominates.

The auricles continue to beat the ventricle stopping completely at intervals This condition is a remarkable parallelism to the results obtained by Chen and associates (8) with toad venom

**Results** Irregular contractions with ventricular arrest, terminating in partial to complete heart block, probably due to impaired conduction caused by injury of the auriculoventricular bundles

On cat

**Procedure** Hypodermic injection

**Effects** With fatal dose the cat gives a series of symptoms Five to 10 minutes after injection, the respiration was deeper and quicker, with a slowing of the rate of heart beat

**Results** The animal was nauseated and unable to hold up its head, lack of coordination was noticeable, the heart beat became irregular and respiration labored with gasping Respiration ceased while the heart beat (auricular) continued indefinitely

#### SUMMARY

- (1) The natural secretion of the granular skin glands of the Salamander, *Triturus torosus* was studied
- (2) Preliminary studies demonstrated that the granular glands produce the toxic secretion
- (3) Local, circulatory and respiratory effects were observed
- (4) Decreased rate and amplitude of heart contractions with partial heart-block
- (5) Predominating effect observed upon the respiration

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## ERRORS IN REPORTED STUDIES OF ENTERIC COATINGS \*

BY F S BUKEY AND C W BLIVEN <sup>1</sup>

Many papers have been published on the subject of enteric coatings Numerous substances have been suggested for enteric material and various methods have been used to test their efficiency Not all of these substances have value and in many cases erroneous results have been reported, due to the method of testing The X-ray, although mentioned by several investigators, has been used by only a few of them Lozinski and Diver (1) used the fluoroscope to locate enteric tablets after ingestion Believing the X-ray to be the only satisfactory approach to the subject, we have employed it exclusively in our studies and feel certain that the results shown correctly reveal the fate of the tablets A few earlier investigators

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\* Section on Practical Pharmacy and Dispensing, A Ph A, Portland meeting, 1935

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stated the time necessary for disintegration. This, it seems to us, cannot be determined accurately, since the physiological factor enters into a study of this kind, making an *in vitro* study of little value. Apparently the solutions used to simulate the gastric and intestinal fluids react differently from the natural secretions. Subjects used in an X-ray study do not react the same to the same type of tablet on different days. It is impossible, therefore, to state how long a tablet will remain intact. The only statement that may be safely made is that concerning the percentage disintegration for a given time.

Lozinski and Diver (1), in their study, used two types of tablets, one composed of barium sulphate, and the other of sodium salicylate. They used the fluoroscope to locate the point of disintegration of the barium sulphate tablet while the disintegration of the sodium salicylate tablet was indicated by the presence of salicylate in the urine. They assumed that since the coating of the barium sulphate tablet withstood the action of the gastric juices the coating of the salicylate tablet was equally permanent. If fluoroscopy is to be used in a study of this kind, it would seem to be a better technique to use all barium sulphate tablets and thereby avoid any doubt as to the point of disintegration of the tablet. Bukey and Brew (2) found in cases where a number of tablets are taken together, that they do not, as a general rule, leave the stomach at the same time. The following cases can be cited to illustrate this point. Subject M. B. took 4 tablets at 7:00 A. M., the first radiograph at 10:00 A. M., 3 hours, showed 3 tablets in the stomach and 1 in the small intestine, the third radiograph at 12 Noon, 5 hours, showed 4 tablets in the small intestine. Subject I. M. took 4 tablets at 8:30 A. M., the first radiograph at 10:00 A. M., 1 hour 30 minutes, showed 4 tablets in the stomach, the second radiograph at 12 Noon, 3 hours 30 minutes, showed 3 tablets in the stomach and 1 in the small intestine, the third radiograph at 1:45 P. M., 5 hours 15 minutes, showed 4 tablets in the small intestine. Many other examples could be cited which would indicate similar results. Bukey and Brew (2) present evidence to show that the average emptying time more nearly approaches six hours than an hour and a half as indicated by Lozinski and Diver (1).

Wruble (3) reported a method for testing enteric coatings which appears to be of questionable value. His method consisted of preparing a tablet mass of such composition that each tablet contained the following:

Methylene Blue	1/4 gram
Calcium Sulphide	1/2 gram
Dextrin	1 gram
Starch	1 gram
Sugar	1 1/4 gram

Wruble made the following statement:

'These so-called double check tablets may be used advantageously for such purpose. If the tablet in the course of digestion loses its coat in the stomach the acid content will react with the calcium sulphide giving rise to eructations of hydrogen sulphide gas. If in the intestinal fluid a blue coloration in the urine will be observed. Should neither of these reactions be noticed it is ample evidence to show that the tablet has passed through the entire digestive tract untouched.

Considering calcium sulphide as a means of testing enteric coatings, it was calculated that 1/2 gram of calcium sulphide produces approximately 10 cc. of hydro-

gen sulphide gas which would be soluble in about 20 cc of water. It appears that the solution of this amount of gas in the liquid of the stomach is possible without the occurrence of eructation. In order to make sure of this point,  $\frac{1}{2}$  gram sugar-coated calcium sulphide tablets were given to a number of subjects. These tablets when placed in water were found to disintegrate in five minutes. To prevent any psychological effect, the subjects were not informed of the contents of the tablets but were merely asked at the end of one-half hour whether any eructation of hydrogen sulphide had occurred. It was found, upon giving tablets to 41 subjects, that 32 subjects reported no eructation, while 9, or 22 per cent, reported eructation of hydrogen sulphide gas. This shows conclusively that an enterically coated tablet containing calcium sulphide might disintegrate in the stomach without the production of eructation. Husa and Magid (4) studied the value of certain materials in preparing enteric capsules. These capsules were filled with a mixture similar to Wruble's calcium sulphide-methylene blue tablets and were tested according to Wruble's method. They also reported the use of orange shellac as a material satisfactory for enteric coating. Bukey and Rhodes (5) found that tablets coated with shellac are of no value. An X-ray study made by them of 24 tablets commercially coated with shellac showed that in every case disintegration took place in the stomach in less than 3 hours. However, they found that if a salol-shellac mixture were used as an enteric coating, the percentage of efficiency varied from 44 to 66.

The use of Wruble's method again appeared in an article by Johnson and Clark (6), in which they tested an application of salol as an enteric coating. Although they used this method, they made the following statement: "There is some question about the effectiveness of these tablets for testing enteric coatings as several students reported no eructations of hydrogen sulphide after taking the uncoated tablets." They found by this method of testing, that salol applied according to their method was an efficient enteric coating. They gave 60 tablets, one to each subject, and found that 52 tablets disintegrated in the intestinal tract and 5 disintegrated in the stomach. Three subjects reported no reaction, which would indicate that the tablets passed through the body unchanged. This point was questioned by the authors who suggested to Dr. Clark that he coat some barium sulphate tablets to be used for X-ray testing. This he kindly consented to do. Forty-seven such tablets were received and given to subjects. It was found that 2 tablets disintegrated in the stomach in 1 hour 30 minutes, 15 in 3 hours, 2 in 4 hours, 3 in 4 hours 30 minutes, 3 in 5 hours, 5 in 6 hours and 2 in 7 hours. Six tablets remained in the stomach without disintegrating at the end of 4 hours and 4 at the end of 6 hours. Only 1 tablet passed into the small intestine and disintegrated within 3 hours. Four tablets passed into the ascending colon in 3 hours and only 1 of these disintegrated. Of the tablets given, 32 disintegrated in the stomach and 2 in the intestinal tract. The point of disintegration of 13 tablets was not determined. Calculated on the basis of the number of tablets disintegrating, it was found that 94 per cent had disintegrated in the stomach.

In order to more accurately test their method of applying salol, additional barium sulphate tablets were coated by their method. After the application of three coats, it was found upon placing the tablets in water that disintegration took place. Therefore, a fourth coat was applied, which produced a coating varying from



0.5 to 0.7 mm in thickness. The question arose as to the quantity of salol on each tablet. This of course would vary with the size of the tablet used. The tablets used in this experiment were 1.13 cm in diameter and the coating averaged 0.16 Gm per tablet. Two such tablets would be equivalent to the official dose of salol which, therefore, would give the therapeutic action of salol as well as that given by the tablet itself.

Forty-three tablets coated four times with salol as described above, were given to subjects and the time and place of disintegration were determined by means of the X-ray. It was found that 5 tablets disintegrated in the stomach in 2 hours, 2 in 2 hours 30 minutes, 14 in 3 hours, 7 in 4 hours and 5 in 5 hours. Three tablets passed into the ascending colon and disintegrated within 3 hours. Seven tablets remained in the stomach at the end of 5 hours without disintegrating. On the basis of the total number of tablets disintegrating, it was found that 91.6 per cent of the tablets disintegrated in the stomach.

These experiments show that salol is not an efficient enteric coating and they offer proof that the calcium sulphide-methylene blue method of testing gives erroneous results.

If it were possible to obtain salol which would not crystallize when applied, a better enteric coating would be produced. This was shown by Bukey and Rhodes (5) who tested two lots of commercial tablets of this type which had an average percentage efficiency of 55.

#### CONCLUSIONS

1. The efficiency of salol as an enteric coating is low, even in mixtures with resins, because of its tendency to crystallize when applied to a tablet.

2. The most effective way to study enteric coatings is by use of the X-ray, which is most advantageously employed in the form of radiography because a permanent record is produced. Fluoroscopy is satisfactory but it has several technical disadvantages, such as the greater number of milliamperes-seconds necessary for each exposure, consequently the individual subject cannot be used as frequently as in radiography, due to over exposure to the X-ray.

3. Because of the relatively small amount of hydrogen sulphide liberated and its ready solubility in the fluids of the stomach, the calcium sulphide-methylene blue method of investigation leads to erroneous interpretations of results.

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Temple University, Philadelphia dedicated its New Library on February 22nd. It was financed by a Government loan of \$550,000.00 and a benefaction of \$278,000.00.

Pittsburgh has been selected for the 1936 meeting of the National Association of Retail Druggists. The headquarters will be the William Penn Hotel.

STUDIES ON THREE U S P AND N F PREPARATIONS BY  
SHORTENED PROCEDURES \*<sup>1</sup>BY W J SMITH AND HENRY M BURLAGE <sup>2</sup>

One important function of the pharmaceutical laboratories of any school of Pharmacy is to study critically the U S P and N F preparations and procedures with the aim of possible improvement of preparations and the shortening of procedures in order to reduce the cost of manufacture. In this manner there might be instilled in the mind of the present-day pharmacist the desire to prepare galenicals rather than the wish to follow the path of least resistance and to order these products from the wholesaler or manufacturer, and to convince him that many such items can be made more economically than they may be purchased. It is our firm belief that the future of pharmacy as a profession in a great part depends on the recreation of this desire in the minds of the practitioners of our profession.

With these purposes in mind the following preparations were studied

## COMPOUND SOLUTION OF CRESOL U S P

This valuable antiseptic solution also known as Cresol Soap Solution and sold under several trade names of varying composition cannot be made according to the official procedure (1) profitably by the pharmacist, since it involves the preparation of a soap from linseed oil and sodium and potassium hydroxides which with water serves as a vehicle for the distribution of the cresol (50% V/V). Experience has proven that the manufacture of a non-irritating soap is a difficult and tedious task, especially if made in small quantities. The official method is time-consuming and the prolonged heating necessary to bring about saponification yields a much darkened product which possesses a fairly high degree of alkalinity.

Since there is considerable demand for this product by the laity our efforts were directed toward a study of proposed methods or modifications whereby the time of manufacture might be reduced so that it might be made with profit and yet meet the U S P requirements. A review of the literature revealed that some work has already been done along these lines. Nitardy (2) has offered a formula whereby a potassium soap is prepared and this with alcohol serves as the vehicle, this method is similar to that offered by LaWall and Cook (3). In 1924, Griffith (4) suggested the use of equal weights of cresol and soft soap and quite recently Berry (5) has prepared a sodium oleate soap to be used in the formula. Following Griffith's suggestions our observations show that a product which apparently meets official requirements may be made according to the following formula

Cresol, U S P	500 cc
Sapo Molhs, U S P	555 Gm
To make	1000 cc

(a) By heating to 70° C or (b) by shaking until solution is effected

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\* Practical Pharmacy and Dispensing, A Ph A

<sup>1</sup> Pharmaceutical Laboratories, School of Pharmacy, University of North Carolina, Chapel Hill, N C

<sup>2</sup> Professor of Pharmacy, School of Pharmacy, University of North Carolina

TABLE I—COMPARISON OF COMPOUND SOLUTIONS OF CRESOL BY PROPOSED METHODS

Method	Approx Time for Preparation	Color	Specific Gravity (25° C)
U S P X	7 25 hrs	Dark brown	1 029 (+)
Nitardy	29 00 mins	Dark brown	1 042
Berry	9 00 mins	Light amber	1 023
Burlage			
(a)	5 00 mins	Light amber	1 032
(b)	6 00 mins	Light amber	1 035

NOTES (+) Average value from four different samples which were 1 030 1 030 1 030 and 1 027 (a) heating to 70° C, (b) shaking until solution takes place

While  $p_H$  values are not reliable when made electrometrically using a quinhydrone electrode on preparations that tend to be fairly alkaline, when prepared by the suggested method results seem to indicate a soap solution of lower alkalinity than by the other methods reported

#### COMPOUND SOLUTION OF SODIUM PHOSPHATE, N F

This preparation approximates a saturated solution of sodium phosphate with citric acid to aid and maintain solution and glycerin added to improve the taste and preserve it. The chief difficulties arising in its preparation are (a) According to the N F formula (6) the salt in the uneffloresced condition is required. It has been found almost impossible to obtain this salt in this form because of unsatisfactory storage and shipping conditions. The solution, therefore, generally contains slightly more of the solute than is necessary for a saturated solution under normal conditions and precipitation to a varying degree occurs upon standing, (b) moistening with water to insure the completely hydrated salt as recommended by the N F is tedious and decidedly unsatisfactory, (c) the solution thus prepared is exceedingly difficult to filter and makes the process time-consuming. In 1921, the following formula was proposed by H M Faser (7) in which the exsiccated salt was used, thereby being assured of using the proper amount of salt

Exsiccated Sodium Phosphate 396.5 Gm (= 1000 Gm of crystalline salt)  
Citric acid 130.0 Gm

Dissolve the chemicals in 800 cc water, heat to boiling and filter into a sterile container add glycerin (150 cc) and sufficient boiled water to make 1000 cc

Our studies prove this method to be highly satisfactory, yielding a solution which keeps well and may be prepared with an appreciable saving of time, at approximately two-thirds of the wholesale price of the N F solution. The following table shows a comparison of the official product and that made by the Faser Method

TABLE II COMPARISON OF COMPOUND SOLUTIONS OF SODIUM PHOSPHATE

Sample No	Method	$p_H$	Sp Gr 22.5° C.	Precipitation After Six Months
1	N F	2.9	1.283	Slight
2	N F	2.8	1.395	Slight
3	N F	2.9	1.407	Slight
4	N F	3.0	1.335	Slight
		Av 2.9	Av 1.372	

5	Faser	5 35	1 315	Negligible
6	Faser	5 50	1 357	Negligible
7	Faser	5 30	1 345	Negligible
8	Faser	5 3	1 287	Negligible
9	Faser	5 2	1 322	Negligible
10	Faser	4 5	1 316	Negligible
		Av 5 21	Av 1 322	

It will be noted that the N F product shows a lower  $p_H$  value and slightly higher and more variable specific gravities than that by the Faser method and was also less stable

#### AROMATIC ELIXIR, U S P

This universally popular elixir has long been the subject of much study by workers with the view of shortening the time for filtration and preparation and improving its flavor. In 1932, one of us (8) offered the results of his studies on five procedures for preparing this product: (a) U S P method modified as to order of mixing, (b) U S P method (9), (c) Shifflett's method (10), (d) Silver's modification (11) and (e) U S P method doubling the amount of talc. The products were studied on the basis of time consumed in preparation, percentages of alcohol by volume, specific gravities, specific rotations, percentages of volatile oil and orders of mixing, and as a result the procedures of Shifflett and Silver were found to be simple, rapid and yielded satisfactory products. These were recommended in place of the official method, with a preference for Shifflett's method since it yields a product conforming more nearly to the official one on the basis of the studies carried out and is slightly more rapid.

Since the above report was made the following workers have studied this elixir and offered suggestions. Fantus and co-workers (12) offer these rules for preparing the galenical: (a) viscosity must be kept low until after clarification in order to facilitate filtration, (b) filtration using talc and other clarifying agents (as shown by Burlage's report) must be abandoned because it is time-consuming and wastes oil and (c) avoid precipitating the oil globules in such a fine condition that they will pass through a filter paper and in turn a longer time for saturation should be allowed. They prepare the elixir by mixing all of the water with the alcohol, adding the compound spirit, allowing to stand for 24 hours, agitating frequently, filtering through a hard filter without the use of any absorbent and finally dissolving the sugar in the filtrate.

Lee and Close (13) in an exhaustive study which includes an extended bibliography of the work done on this elixir prior to 1933 present a discussion under the following headings: (a) flavoring agents, (b) alcohol and sugar contents, (c) clarifying agents and (d) methods of making. Fourteen procedures or modifications are followed and in a table the following are reported: (a) appearance of the finished product, (b) number of times filtrate is returned to filter before a clear product is obtained, (c) rank as to time required for filtration and (d) the condition of product after two years on the basis of odor, taste and sediment. In the table Shifflett's method has a ranking of 7, a procedure in which sugar and water are substituted for syrup 3, U S P method, using in place of talc purified siliceous earth 4, using kaolin 2 and magnesium carbonate 1. They recommend the following formula and method:

Compound spirit of orange	12 cc
Purified talc	30 Gm
Sugar	320 Gm
Alcohol	the desired amount
Distilled water to make	1000 cc

Mix the spirit and talc by trituration, add about 800 cc water in convenient portions and triturate after each addition, agitate frequently for about 15 minutes and filter in the usual manner. Dissolve the sugar in 550 cc of the clear filtrate and to it add the desired amount of alcohol and make up to 1000 cc with the required amount of clear filtrate.

This procedure is recommended because the time required to prepare the product is about one-tenth of that for the official elixir, the alcohol strength may be varied at will without modifying the technique of the preparation and is always clear regardless of the variation in alcohol content.

About the same time Havenhill and Smolt (14) reported that the terpenes present in the aromatic oils of the compound spirit of orange, since they are not soluble in the dilute alcohol used, are almost completely precipitated and are the chief causes of the difficulties arising in elixir preparation, and that the oxygenated principles of the oils are the desirable constituents, which do not cause cloudiness. Their studies involved (a) the determination of the alcohol strength that could be used in preparing the compound spirit that will extract sufficient oxygenated principles but not enough terpenes to precipitate even upon dilution in making the elixir, (b) the estimation of the strength of the new compound spirit as compared with the official one with regard to oxygenated principles, (c) the determination of the relative amounts of these principles in the official elixir and (d) the calculation of the amount of soluble spirit necessary to make an elixir similar in flavoring strength to the one recognized. Two formulas for the soluble compound spirit are offered (a) using the official compound spirit and (b) using the required oils, as well as one for an aromatic elixir using these soluble compound spirits and requiring no filtration. A study of this method revealed it to be quite wasteful of oils.

As a result of this latter work it occurred to us that since terpeneless oils can now be purchased reasonably, these oils might be used in making a compound spirit of orange to prepare a satisfactory elixir. This idea is not entirely new, as Jones (15) in 1922, proposed a formula in which a soluble compound spirit consisting of terpeneless oils of orange and lemon with anethol and coriander was used. Accordingly two compound spirits were prepared (a) by substituting for the oils in the official spirit the like amount of terpeneless oils and (b) since these oils are much higher in desirable principles than the official oils, one-tenth of the amounts of oils as employed in (a) were used. These spirits were then employed in making the elixir by the official procedure, omitting talc. Since the finished product is slightly opalescent it is filtered through a hard filter. Usually one filtration only is necessary. The product thus obtained is brilliantly clear, has a delightful odor and taste which may be varied in degree by using variable amounts of the new compound spirits.

*Further Studies on Aromatic Elixirs*—In preparing a display to show the evolution of this much used elixir it was found that since 1871 about fifty procedures have been offered (see reference 13). Further examination demonstrated that the following comments or observations can be made (a) clarifying agents recommended were

paper pulp, magnesium carbonate, calcium phosphate, talc, kaolin and infusorial earth, (b) specific gravities varied from 1.027–1.133, (c)  $p_H$  4.2–7.7. Those using  $MgCO_3$  as filtering agent showed a range of 6.05–7.7, with calcium phosphate, 4.8–5.85, with talc 5.75–6.85, kaolin 6.5 and infusorial earth 6.3.

TABLE III—COMPARISON OF AROMATIC ELIXIRS MADE BY VARIOUS FORMULAS

Method	Filtering Medium	Rating as to Time Consumed	Spec. Gr.	$p_H$
1 Shifflett	(a) Talc	3	1.140	4.0
	(b) Talc		1.057	See Reference No. 8
2 Silver	(a) Talc	3	1.112	3.8
	(b) Talc		1.069	See Reference No. 8
3 Fantus	(a) Hard filt	3	1.099	5.6
	(b) Hard filt		1.086	6.0
4 Lee and Close	(a) Talc	2	1.104	6.3
	(b) Talc		1.057	5.3
5 U S P Modified	$BaSO_4$	4	1.102	4.2
6 Havenhill and Smolt*	(a) —	4	1.080	4.2
	(b) —		1.095	4.3
7 Burlage and Smith	(a) Hard filt	1	1.084	6.6
	(b) Hard filt		1.075	6.5
	(c) Hard filt	1	1.080	6.7
	(d) Hard filt		1.051	

	Sediment	Color	Odor	Taste	Comments
1	+++	sl y	or	unp	Made May 1934
2	++++	sl y	or	ter	Made May 1934
				n unp	
3	+++++	milky	sl or	n unp	Made May 1934
	+	clear	or	n unp	
4	+	clear	sl or	p	Made May 1934
	None	clear	sl or	p	
5	+++++	milky	or	p	Made May 1934
6	++++	clear	or	unp	Made May 1934
	+++++	clear	or	unp	
7	None	clear	or bl	p	Terpeneless oils for oils in U S P
	None	clear	or bl	p	Com Spt
	None	clear	or bl	p	$\frac{1}{10}$ amt of terpeneless oils as in (a)
	None	clear	or bl	p	and (b)

NOTES \* Rating of 4 includes time for making the sol spirit, if this is disregarded rating is 2. sl y = slight yellow, or = orange, sl or = slight orange or bl = orange blossom. unp = unpleasant, n unp = not unpleasant, ter = terebinthinate, p = pleasant. All elixirs unless otherwise designated were examined after four months and all used Compound Spirit of Orange U S P, except the methods of Havenhill and Smolt and Burlage and Smith.

In a study of Table III it is interesting to note that the older samples showed a sediment from slight (+) to considerable (+++++), that there is an appreciable increase in specific gravities on aging which might be caused by a gradual loss of alcohol or volatile oil or due to other changes which no doubt occur since the  $p_H$  values of the older samples in most cases were lower than the average  $p_H$  (6.3) for elixirs made by using talc or those of the fresher samples. These changes are also accompanied by some alterations in color, odor and taste. All samples were preserved in well-corked containers and kept in a room at a fairly constant temperature.

## SUMMARY

- (1) A rapid method for preparing compound solution of cresol is offered
- (2) The method of Fraser for preparing compound solution of sodium phosphate is recommended in place of the present N F method
- (3) Methods proposed since 1932 for the preparation of aromatic elixir are reviewed and the preparations so made are studied
- (4) A reasonably rapid method for making this elixir from a compound spirit of orange with terpeneless oils is recommended

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## THE PHARMACOGNOSY DEPARTMENT AT EGYPTIAN UNIVERSITY

BY RALPH BIENFANG \*

Egyptian University is located in Cairo, and was founded in 1925. It offers instruction to Egyptian youth in four faculties: letters, law, sciences and medicine. Instruction in pharmacy is given in the faculty of medicine, hence the pharmacognosy department is within that faculty.

The original director of the pharmacognosy department, called by the University in 1925, is still directing its activities. He is Dr Ibrahim Ragab Fahmy, who first qualified in Egypt, and then studied under Greenish, Tschirch and Wasicky. He is author of numerous research papers on Egyptian medicinal plants and drugs, some of which have been published in English, and also of two textbooks in pharmacognosy: "Medicinal Plants and Their Vegetable Drugs," Cairo, 1932, and "Constituents of Plants and Crude Drugs," Cairo, 1933. These texts are published in English, the first, however, has an auxiliary table of contents in Arabic.

Dr Fahmy is assisted in his department by two lecturers qualified from the University of London, one holding the B Pharm, and the other both the B Pharm and the Ph D, a curator of the museum holding the B Pharm from Egyptian University, and a fourth who is at present on a mission in Berlin.

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\*University of Oklahoma School of Pharmacy

Instruction in pharmacognosy for the hundred students usually enrolled in pharmacy extends over three years as follows

In the first year the students are given three lectures, two practical classes of three hours each, and one hour of demonstration in the museum per week. The theoretical course deals with the study of the groups of the vegetable kingdom. The drugs obtained from each group are dealt with in detail from the following points of view: geographical distribution of the drug-yielding plants, and methods of cultivation, period of collection and preparation for market, morphology, anatomy, constituents, uses, commercial varieties, the chief adulterants and substitutes, and history of the drug. The practical course includes the study of the morphology and histology of the drug and its varieties, if any.

In the second year the students are given four lectures, three practical classes of three hours each, and one hour of demonstration per week. The theoretical course deals with the study of the chemistry of the constituents of the vegetable drugs classified according to their chemical nature. The following groups are dealt with: Alcohols, carbohydrates, glucosides, tannins, pigments and coloring matters, acids, bitter principles, fixed oils, fats and waxes, ethereal oils, oleoresins, resins, gum-resins, balsams, alkaloids, proteins and enzymes, vitamins, etc. The practical course includes the detection, chief reactions, estimation and isolation of the chief members of the above-mentioned groups. Also the standardization of the pharmaceutical preparations which include any of the above groups is carried out.

In the third year the students are given two lectures, two practical classes, each of three hours, and one hour of demonstration per week. The theoretical course deals with the application of the knowledge of the first- and second-year courses in the analysis of the vegetable powdered drugs and products according to the pharmacopœial standards. The practical course includes the study of the vegetable powdered drugs and the microchemical tests of their constituents, if any, and also the detection of adulterations in powdered drugs both by microscopical and chemical means. The analysis of mixtures of the same and the identification of vegetable powders in pharmaceutical preparations are also dealt with.

In addition to the undergraduate instruction given, the department maintains an active research laboratory, results of work in which are usually published as a special volume of the "Report of the Pharmaceutical Society of Egypt."

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## A COURSE IN THE STUDY OF DRUG STORE SUNDRIES

BY HAAKON BANG \*

According to figures published in the *American Druggist* by Dean DuMez, approximately 69 per cent of his graduates go into retail stores. A great many of these later become owners or managers of stores. Of course the pharmacist must know as much as possible about the medicines he dispenses, but he must also know as much as possible about all of the merchandise sold in drug stores. The knowledge is not only necessary to himself in selling, but also in training those who work for him.

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Merchandise on the shelf does not bring profit. It takes salesmanship to bring about the sale of this merchandise. As salesmanship depends upon a thorough knowledge of the articles to be sold, it is therefore necessary first to acquire such knowledge.

The schools of pharmacy are probably the best places to impart knowledge as it is more apt to be given impartially. It is much easier to obtain such information from the college libraries than from the libraries of some of the small towns in which the drug store may be located.

Oftentimes the man working in a store does not have the time nor facilities for digging out information which would aid him in selling the merchandise which he keeps in his store. It is better, then, that this be done in school where the future pharmacist has the time and is in a receptive mood.

As to what should be taught would depend, to a great extent, upon the conditions met with in that particular district and for what type of work the student is being prepared.

The syllabus appearing in the November (1931) issue of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, prepared by Dr. C. W. Ballard is excellent and meets the needs of a course of this type. The course as outlined deals with appliances having a pharmacologic or therapeutic aspect. This course has a professional pharmacy air, but it could be made more commercial in nature. There are certain phases which might be discussed in this course.

The technique of using a camera and choosing film material could be included in a course of this nature. Many students who are not amateur photographers would not know how to instruct their customers in the proper use of the camera and its accessories, nor would they be able to instruct their sales force. Even handling the material in a store may not give a person enough information to properly fit him to sell. There is no question about the value of a photographic department in the drug store. People expect the country or suburban store to develop their films and handle their photographic wants. It is probably true that no other department, with the exception of the prescription department itself, yields a larger gross profit, a greater turnover, or will bring the customer in more frequently. In many stores the photographic section receives an important place in the store, especially during the vacation season. Is it not, then, desirable to have well informed clerks care for this department? A great deal more business may be worked up in this division if the man in charge is a photographic enthusiast. It is often possible for the druggist to organize a camera club and, by instructing members in the use of the camera and its appliances, increase sales of camera supplies.

Lecture material may be obtained for this section from the Eastman Kodak Co. and, also, by studying literature found in the library on this subject. Certain books on optics clearly describe lens and film equipment.

Another profitable line among drug sundries is bristle goods. When a customer wants a brush he immediately thinks of the drug store, especially if he lives in a small town. Lecture notes on the history, method of manufacture, sales points and methods of care and preservation are very hard to find, yet it should be included in this course. Generally the busy practicing pharmacist does not, or cannot take time to get this material himself. It is best, then, that he learn this in college.

Manufacturers of bristle goods are glad to cooperate with the instructors to

furnish lecture and demonstration material on this subject The types of brushes which should be considered and which are listed in Charters' report are hair, tooth, bath, bottle, hand, camel's hair, nail, massage, complexion, eye brow and face brushes, given in order of their importances Shaving brushes also should be discussed

It has been the experience of every salesman that it is possible to sell a more expensive article, providing he can point out to the customer the quality of the more expensive one, showing why it would pay to purchase quality merchandise In this way much bristle goods business which is now going to the variety store may be brought back to the retail druggist

A study of foot preparations may also be included in this course, as they occupy an important place in the drug store It is possible to sell related appliances provided something is known about this class of merchandise, for instance, how many druggists will suggest the use of a metatarsal arch support to a customer who is suffering from soft corns? Yet, about 90% of soft corns are caused by a weakened metatarsal arch Such information makes it possible for druggists to increase their sales and thereby their profits

In visiting a number of stores this summer, and speaking to the proprietors or managers of the stores, I found the greatest criticism of the graduate was that, although his theoretical training was good, his practical training was lacking In the front of the store he was a liability rather than an asset

By including courses of this nature, which would familiarize the graduate with the articles commonly sold in drug stores, this criticism would largely be overcome

It would not be necessary to make this course required If a student plans on entering the retail pharmacy field he will see the value of training in this line If he intends to follow scientific lines he may find other courses more valuable to him

A course of this nature may be made interesting by including the history of various items discussed Sales talks, by various members of the class, with criticism, may also be used, although this must be limited, as time generally does not permit extended discussion However, certain errors in salesmanship may be shown and the students become more critical of themselves and others

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## THE PRESENTATION OF BASIC SCIENCES IN A SCHOOL OF PHARMACY \*

BY T C DANIELS <sup>1</sup>

In November of 1933, an article appeared by Klemme (1) on "Why Organic Chemistry Should Be Taught in the School of Pharmacy," in which an appeal is made to stress the application of this subject to the professional needs of the student The article presents one side of a fundamentally important question in Pharmacy education Since my experience is somewhat at variance with the views expressed in this article, I should like to present for your consideration some reasons why Organic Chemistry and other basic sciences should not be presented with this so called "pharmacy-slant "

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\* Section on Education and Legislation, A Ph A., Portland meeting, 1935

<sup>1</sup> University of California, College of Pharmacy

I believe pharmacy education has suffered more as the result of modification and attempted application of the basic sciences than from any other single educational factor. This method of presentation was a necessary evil when the two and three-year curriculums were standard, but in a four-year curriculum it is not necessary nor justifiable. The fundamental method of approach as advocated by Harrod (2), Little (3), Jenkins (4), Fischelis (5), Rudd (6) and others decidedly represents the preferred method of instruction.

There have been many attempts to modify textbooks of Chemistry, Physics and Botany "to meet the needs of students of Pharmacy." These attempts for the most part have resulted in abbreviated, simplified texts partially or wholly inadequate for their intended mission. How many applied texts in chemistry or physics have you examined that you consider the equal of a sound text concerned only with the presentation of the fundamentals of the science? The pharmacist of the future, in order to properly discharge his duties, must be thoroughly trained in the fundamentals of physics, chemistry and the biological sciences, otherwise his professional service is limited largely to the status of a pseudo-technician having little understanding of his chosen work. It must be recognized that a broad and adequate foundation in the basic sciences is a prerequisite to their application which must follow. Indeed, pharmacy consists essentially in their application. "Watered courses" in these sciences are a menace to the proper growth and development of the profession.

We must all agree on the absurdity of expecting a student to apply a science without having first mastered its principles and gained a proper perspective of its significance.

There is a great deal of truth in the statement that "a little knowledge is a dangerous thing." Does the pharmacy student require less of the "fundamental principles and their application" than the chemical engineer? Does he require less of a knowledge of "reaction mechanism, atomic and molecular structure and the application of physico chemical methods to the synthesis and analysis of chemical compounds" than the student majoring in chemistry? If that is your opinion, then you must also believe that it is unnecessary for the pharmacist to know anything of the syntheses and development of new drugs or of their physical and chemical properties. Without such training all information on substances of such complexity as drugs must necessarily be gained by rote. This is neither feasible nor desirable.

In order to arrange for a satisfactory transfer of credits from colleges of pharmacy, it is necessary that educators in other fields give full recognition to the courses in basic science. This recognition will largely depend on the contents and method of presentation and only where basic and fundamental instruction is rigorously employed can it be expected to meet with approval.

The proponent of the applied system of basic instruction will say, to be sure we must teach the principles of these sciences, but why not point out to the student, in passing, points that are of interest to his profession? I believe such teaching is psychologically unsound, because the pharmacy student is above all interested in those things which apply to pharmacy, and if principles are continually referred to the thing in which he is most interested it becomes for him a detached fact applicable to his interest, and not a principle which can be employed as such. I ur

thermore, there is a tendency for the student to over-emphasize those things which apply directly to his profession and to consider all others of lesser importance. To clarify this point somewhat, assume a course is being offered in Analytical Chemistry for students of Pharmacy and in order to present an applied course official preparations are selected for the instruction. The student may master fully the material presented. He may be able to write chemical equations, and give explanations for the reactions involved, but unfortunately he is not grounded in the principles necessary to permit him to work independently. He is more than likely to be at a loss when placed on his own initiative. It is true he has learned many facts concerning analysis but nothing of principles which he is capable of applying to new problems. On the other hand, if he had mastered a sound course in the principles of analytical chemistry without reference to its application, his chances for working independently are much greater whether the work is, or is not related to medicinals. In my own opinion, time spent in the application of a basic science is time not only lost in the development of the subject, but that it serves also to confuse the student because of the cross-objective fundamentals and their application.

In the examples of ether and chloroform mentioned by Professor Klemme, certainly no harm results in pointing out that ether is capable of peroxide formation and that chloroform is stabilized by the presence of a small amount of alcohol, etc. It is, however, to my way of thinking, a very serious mistake to discuss ether and chloroform of the United States Pharmacopœia in a basic course in organic chemistry. The teacher of a basic science must remember that he is teaching a subject, whether he is teaching a group of chemical engineers, pharmacists or chemistry majors is purely incidental and ideally should have no influence in the presentation of the subject. He is concerned with the teaching of basic principles only and the more successful he is in this instruction, the easier it will be to apply the subject in courses which must follow. In order to cover the principles of organic chemistry, and to attempt application at the same time as suggested by Professor Klemme, it would require a year course of at least ten units per semester, and even with such a course it is quite problematical if the student would finish with a useful perspective of the subject.

As to whether the basic science courses are presented in the colleges of pharmacy proper, or are presented in their respective academic departments, is a matter of no great concern and should depend entirely on the facilities and general organization of the school. It is of great importance, however, that wherever they be given, they shall be presented in a purely academic and fundamental manner.

I do not wish to be dogmatic on a subject having so many variable factors as teaching. It is commonly recognized that a great deal depends on the individual teacher, his training and experience, but I do want to call your attention to the danger of encouraging application of the basic sciences as a general educational policy. If teachers of such courses, with pharmacy training as a background, fail to recognize this danger, then teachers having no training in pharmacy should be preferred for the presentation of these subjects.

There is time available in a four-year curriculum in pharmacy to give good fundamental training in the basic sciences, with time remaining for their proper

application Students receiving such training will be able to work with greater understanding and be better prepared for handling their professional problems

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### ENTANGLING ALLIANCES \*

BY W F RUDD <sup>1</sup>

The price we pay for experience is disillusionment The enthusiasm of youth sees the highways of life largely as parallel ways with few convergencies and fewer dangerous intersections and so it goes all through early adolescence Whether the issue be work or play or love or ambition, youth treats them all as individual problems

Hardly are we out in the world, however, when the picture changes abruptly, and often completely Decisions on any important issue are inextricably interwoven with decisions already made, and with others that we little dreamed would be so promptly forced upon us

Trite observations, you will say, and they are But upon just how well we learn to avoid unnecessary entangling alliances, or finding ourselves already in them, how well we are able to balance them against one another in the light of the principles involved or in the light of our experience, is at least one measure of our ability to make a place for ourselves in the world

Just what all this has to do with the section on Education and Legislation is a natural inquiry My only apology for this paper is that in my deliberate judgment few of life's activities present more of them and more dangerous entangling alliances than does the broad field of pharmacy

One speaks with confidence only from one's own experience It is therefore necessary to be somewhat detailed and personal in this brief paper College of Pharmacy deans and their staff members have opportunity to see the currents and cross currents in pharmacy in a most intimate fashion Nor are we permitted to live apart and watch these currents in an impersonal way We are caught in them, whipped about, lose our moorings, are temporarily submerged and some of us lose out permanently The more stalwart ones emerge battered and bewildered but usually, perhaps, better prepared for the next emergencies There is no excuse for such figures of speech except that one naturally hesitates to approach the subject boldly and in detail However, a few concrete examples of some of the more important cross currents which have materially affected pharmacy may be cited to indicate how involved it all is

A common experience among our group is some sort of consulting connec

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\* Section on Education and Legislation, A PH A Portland meeting, 1935

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tion in pharmacy, chemistry or other closely related fields. Such connections may extend all the way from strictly ethical problems, such as finding profitable and legitimate uses for by-products or changing the method of manufacture to increase the yield and decrease the cost, to that of being called as an expert witness in defense of some widely advertised and falsely acclaimed nostrum. In between these extremes are all sorts of problems just on the border line between right and wrong. Each case must be decided on its merits and the more questionable the issue the larger the money temptation usually is. Practically every man in this group has had issues of this nature to decide and with our conscience as our guide many of them have given us restless nights. Early in my own work I was asked by a friend, who operated a large tannery, to help him find something that their leather would absorb readily. Of course, it must not be harmful to the leather but it must be heavier than and cheaper than the leather itself. The object was that they might manufacture their product at a price per pound with more profit than their competitor's product not so heavily loaded with cheap material. I think you will all agree that a college of pharmacy dean or teacher associated just once with a recognized fraud or who uses his influence with his own students for personal gain, necessarily loses much of that finer ethical sense and power for pharmaceutical righteousness that all of us covet for ourselves. Later, after becoming a college dean I was asked to take over the state agency for a well-known insurance company.

Another cross current in which we frequently find ourselves is the pressure to allow the use of our names in connection with all sorts of advertising schemes. Usually the invitation comes to us as what would seem to be a wholly innocuous suggestion. Do you favor the use of pure chemicals and standard pharmaceuticals in prescription work? If you do, say so in a few well-chosen words and let us publish your stand on this important matter. So far this is perfectly good form. However, the page on which one's picture and the word of endorsement of pure products in prescriptions are published probably carries the ad of A's chemicals or B's pharmaceuticals. And so there you are. Nothing wrong in it all, but usually if we had fully realized just what sort of position we were being jockeyed into, we would have been a bit more careful, perhaps. Look over your files and see how many times across the years this sort of invitation has come to you.

How many students our colleges of pharmacy should train so that pharmacy itself may be most adequately served is a controversial subject of major importance. There are honest differences of opinion on the subject among men who are close personal friends.

Unfortunately the economic status of the schools themselves is one of the determining factors in the point of view of the administrations involved. Where all the income must come from student fees, the pressure to take large numbers is sometimes overwhelming. Where salaries seem reasonably secure whether the student body is large or small, we are apt to become hypercritical of the men who yield to the pressure to train many more pharmacists than we believe are needed. These cross currents have at times threatened to split our forces irrevocably and in instances have occasioned fundamental dissensions.

It seems reasonably safe to say that until all the schools of pharmacy are able to derive a fair share of their income from endowment or state aid it will be impossible to reconcile these extreme points of view.

The gradual disappearance of much of the orthodox prescription building of the old-time physician and the substitution therefor of pharmaceutical specialties better known as proprietaries is deprecated by the best there are in retail pharmacy of to-day. How it has come about need only to be sketched here. Laboratory workers in Pharmacology in medical schools became therapeutic nihilists, therefore, little *materia medica* and less prescription building were taught embryo physicians.

These same young doctors are therefore the legitimate prey of every ready-made product that the skilful detail man brings to them in this time of their utter ignorance of how to select or how to put together the proper medicaments in orthodox fashion. The paradoxical part of this is that the same manufacturer who asks the physician to specify and the druggist to stock his regular pharmaceutical line, pushes to the limit already prepared combinations of these same samples, frequently, as we know, to the detriment of the physician, the pharmacist and the patient. This chain of entangling alliances is one of the most difficult problems in pharmacy. What is to be done about it is a primary concern of pharmaceutical educators and retail pharmacy, and if ever settled, must be done by these two groups working together closely with practicing physicians everywhere.

The U S P is both the pride and the prize of American Pharmacy. The pride because it is accepted as the government standard for drugs. And the prize because the control of its business affairs and its decennial revisions carry definite prestige and, in instances, considerable financial rewards to individuals and groups chosen for this work. Some day a story of the entangling alliances that have existed, and still exist, in order to retain or to change this control, will make perhaps the most interesting chapter in the whole history of American Pharmacy. We speak feelingly on this subject.

In the three U S P conventions we have been privileged to attend, these cross currents have become whirlpools and have aroused strong and even bitter antagonisms that last sometimes across the intervening decades. It is safe to say that in no pharmaceutical activities in this country do we find ourselves in a better position to accurately discriminate among men. Where loaves and fishes are to be distributed the true characters of individuals and groups stand out in bold relief. If you want to see entangling alliances at their worst, sometimes at their best, get on the near inside of the next U S P Convention.

The most recent and in many respects the least understandable entangling alliance that can be laid on pharmacy's doorstep is the attitude of the nationally organized groups in pharmacy toward proposed new food and drug legislation.

A roll call of these organizations is probably in order. Those holding membership in the N D T C are the most representative and are as follows: AMERICAN PHARMACEUTICAL ASSOCIATION, National Association of Retail Druggists, American Drug Manufacturers' Association, American Pharmaceutical Manufacturers Association, The Proprietary Association, National Association Boards of Pharmacy, American Association of Colleges of Pharmacy, Federal Wholesale Druggists' Association and the National Wholesale Druggists' Association. Since these reasonably well cover the field, others will be omitted.

Probably every close student of pharmaceutical affairs who knows the nature of the pharmaceutical interest or personnel of the leaders in these individual groups,

or both, found themselves early in the discussions of this legislation wondering just what would be the attitude of these same individuals and groups toward it

Would the groups whose primary concern is public health stand together or would there be a line-up that on the surface at least seemed hopelessly entangled? Would all of the colleges of pharmacy favor rigid control of the advertising and sale of standard nostrums? Would the parent organization, the A P H A, lend its influence to the kind of legislation favored by the colleges, or would it find itself closer to the patent medicine group? Would the N A R D when face to face with its public health responsibility meet the obligation squarely on its merits? Would men who by virtue of their ability and long experience in many phases of pharmacy have become recognized leaders among us, take their stand on the side of public welfare or in the protection of the interests? Questions of this nature forced themselves on you and on me. If you have followed the course of this legislation closely during the two years it has been in the public eye, many of these questions have been answered for you. And in instances the answers probably leave you bewildered.

And so we could add to this list of entangling alliances in pharmacy almost indefinitely, but to prolong it is futile.

What sort of influence on pharmacy of to-day have these cross currents had? Why have we too many pharmacies and too many pharmacists? Why do we have interlocking directorates which make it impossible for one to tell just where many leaders in pharmacy will stand on important pharmaceutical questions? Why have the proprietary interests been able to develop so powerful an influence in the whole field of pharmacy? Why has prescription practice fallen to so low a plane? Why have we so much desperate commercialism in a public health profession?

Why are we the butt of the jokester? Why is there no organization in pharmacy that can speak for all of pharmacy?

You are entitled to answer these questions in your own way. Calmly and deliberately I am constrained to believe that entangling alliances for the sake of loaves and fishes are responsible for much of our desperate condition. Relatively few of us have believed profoundly that public health is the one real objective of pharmacy. Failure in this great fundamental has led us into one error after another. Few of us have had a single purpose and a single interest in our work in pharmacy. I, along with many of my close friends, must plead guilty to this charge. Younger men have seen us sell our birthrights for a mess of pottage, and they have followed our examples.

And is there no hope? Is there no silver lining to this picture of our profession which we see painted darkly almost as often as we see it painted at all? Shall we tell our young men and women not to prepare themselves for a service whose present status is so hopelessly involved?

I am going to be bold enough to say that if the situation is ever to grow better we school-men have got to accept the major responsibility for making it so. With forty-four states now requiring college training as a prerequisite for pharmaceutical practice, and practically all the colleges requiring the standard four-year course, it has been put into our hands to bring about in the next half century three things which will at least help untangle this complicated web which is called modern pharmacy.



In the first place the schools of each state must work toward a greatly reduced number of pharmacists. With this will, inevitably, come a gradual decrease in the number of pharmacies, and no permanent change for good can be effected until this is done. Economically and as a corollary, professionally, this is a crying need.

In the second place we must train students who pass through our hands to be primarily public health conscious. No one school nor small group of schools can do this colossal task. It must be nation-wide in its scope. The American Association of Colleges of Pharmacy must make this its primary concern.

The AMERICAN PHARMACEUTICAL ASSOCIATION must rededicate itself to the task.

The N A R D can do no better service for its constituents than to ever lastingly preach the gospel that "A well-informed pharmacist is the best single individual to disseminate information about public health."

Men trained to this point of view should alone manufacture or distribute medicinal agents of any description.

In the third place, and this is the crux of it all, and by far the most difficult to do, we as educators must see to it that we do not allow ourselves to be drawn into these entangling alliances which slowly but surely distort our ethical outlook, weaken our influence with those who come to us for their professional training and finally lead us into partnership with forces that look upon this age-old service to mankind as merely the acquisition of loaves and fishes at the expense of the ignorant and gullible ill and near ill who come trustingly to us for aid and comfort and relief in the most troublous times of their lives.

## MEDICAL PRACTICES OF THE NEW ENGLAND ABORIGINES<sup>1</sup>

BY WILL T. BRADLEY<sup>2</sup>

1 *The New England Tribes*—Just before 1620 there were eight leading tribes or confederations of Indians living in New England. These included the Abnakis, whose villages extended down through Maine toward the mountains of New Hampshire, the Pennacooks, dominating southern New Hampshire and north eastern Massachusetts, the Massachusets, who inhabited chiefly the region about Boston Bay, but whose dominion went westward toward the Berkshires, perhaps as far as Deerfield, the Wampanoags, in southeastern Massachusetts, allied with the Nausets on the Cape, the Narragansets, whose country lay to the north and west of Narraganset Bay and included Block and several smaller islands and part of Long Island, the Mohicans, who had been driven eastward from the Hudson by the Mohawks of central New York, and whose leading members here were known as the Pequods, with headquarters at what was to be New London, Connecticut, the Wappingers, crowding along the shore of the Sound in southeastern Connecticut and part of New York, and finally, the Nipmucs, apparently the remnants of a once-powerful tribe, now scattered as tributaries of the Pennacooks,

<sup>1</sup> Abridged by the author from a paper read before the Section on Historical Pharmacy

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Massachusetts, Narragansets, and Pequods, in northern Rhode Island and Connecticut, central and western Massachusetts, and southern New Hampshire. Several of these tribes claimed a total population of thirty thousand, and each boasted some two to three thousand warriors.

They were all members of that considerable body of Indians, known as the Algonquian Stock, which shared a common language and which had united the eastern seaboard from Canada to Florida by a network of excellent trails. The ancestors of the Algonquian tribes had come out of the West, probably not many generations before, since their descendants vividly recalled the migration in song and legend.

Now, though related by blood and most certainly by language, the tribes in New England were by no means all alike in culture and tradition, but there were many traits common to the lot.

Briefly it may be said that the tribes to the north, especially the Abnakis, were most practiced in the arts—they were the only Indians in the whole region who had any sort of picture-writing, though even they had no conception of a written language, and they were skilled in weaving and painting. The southernmost tribes were more commercially minded and (a common relationship) more warlike, and since the waters of the Sound furnished the varieties of shell fish from which were made the white and blue wampum beads used by all the Indians for currency, the Narragansets and Pequods naturally became the mint-masters of the whole district, at great profit in skins, furs, and other commodities.

Each tribe had its Grand Sachem, and each community within a tribe had its Sagamore or leader. Chieftainships were sometimes hereditary, more often a leader was chosen by ordeal, with any brave man eligible for the test. A favorite method was to administer the rhizomes and roots of American Hellebore, the warrior whose stomach withstood its emetic action longest was judged to be fittest for leadership.

On the whole, the early settlers found the Indians to be human beings of primitive but far from savage culture, friendly and trustworthy, as well as trusting, until taught to hate the guile of the invaders who so openly despised them and so stupidly and arrogantly underestimated their maturity and pride. They were certainly superstitious—for what human race is not?—and no doubt deeply religious. In their practical affairs they were guided by a wealth of experience in their own kind of living which, when met on their own ground, put to shame the blundering theories of the white settlers.

It was not long before the Whites began asking the Redmen what animal and vegetable life was edible, what was not, which districts were healthful, which to be avoided, how to build canoes, how and where to hunt, fish, and construct camps to protect themselves from attack of beast and man, how to get conveniently about the country, and, most frequently, how in this new climate, with nothing better than fresh water to drink, to keep well.

That which the settlers learned from the untutored Indians, they earnestly reported to their scientific brethren in Europe.

2 *The Health of the Aborigines*—Because of these early reports, we know more about Indian remedies than what they were used for—more about their medicine than their ailments. The reason is that Indian nomenclature for Indian diseases

was not accurately translated into our own medical terms, and consequently, though we know (say) that the Penobscots used Blackberry Root (*Rubus sp.*), Christmas Fern (*Polystichum acrostichoides* [Michx.] Schott), Coral Root (*Corallorhiza odoratior* Nutt.), Goose-Grass (*Galium Aparine* L.), Mayflower (*Epigaea repens* L.), and Rockbrake (*Polypodium vulgare* L.), we do not know what ache or pain called for the use of any of these

The modern investigator must attempt to answer three sets of questions

(1) What diseases did the Aborigines know?—how shall we distinguish between their original diseases and those contracted from intercourse with Europeans?

(2) What was the true nature of their medical practice?—was it a sound practice?—was it largely based on superstition?—how many medicines had they command of?—how were these prepared and administered?—were their properties definitely or only vaguely known to the Aborigines?

(3) How much of real value did they teach the Whites?

In searching out the answers to these questions, our eagerness must be restrained by a logical skepticism, and we must never overlook the certainty of frequent error in our sources, for we cannot escape three ironic conditions (1) the Indians and the settlers never very well understood each other, (2) primitive sense of humor dealt freely in misdirection, bluff, exaggeration, (3) the settlers were conspicuously gullible and credulous

Indian health was no doubt painted too attractively from the beginning In 1629 William Wood came to New England, and when he returned home in 1633 he wrote a book called "New England's Prospect," in which, as a means of inducing Englishmen to go over and settle, he carefully described the bodily fitness of the natives He insisted that

the *Indians* be of lusty and healthfull bodies, not experimentally knowing the Catalogue of those health wasting diseases which are incident to other Countries as Feavers, Pleurisies, Callentures Agues Obstructions Consumptions Subfumigations Convulsions, Apoplexies Dropsies Gouts Stones Tooth aches Pox Measels or the like but spinne out the thread of their dayes to a faire length, numbering three score foure score some a hundred yeares before the worlds universall summoner cite them to the craving Grave "

In stature, Wood found that most of the Indians were

betweene five or six foote high straight bodied strongly composed smooth skinned, merry countenanced of complexion something more swarthy than *Spaniards* black hair d, high foreheaded blacke eyed out nosed broad shouldered brawny arm'd long and slender handed out breasted small wasted lankel bellied, well thighed flat kneed handsome growne legs, and small feete I have beene in many places, yet did I never see one that was borne either in redundance or defect a monster or any that sicknesse had deformed, or casualitie made decrepit saving one that had a bearded eye and an other that had a wenne on his cheek "

Another writer, with a great interest in natural history, John Josselyn, who traveled in New England in the 1630's and again in the 1660 s, said of the Indians

The Men are somewhat Horse Fac'd and generally Faucious & without Beards but the Women many of them have very good Features seldome without a *Come to me* or *Cos Amoris* in their Countenance all of them black Eyed having even short Teeth and very lute their Hair black thick and long broad Breasted, handsome streight Bodies and slender considering their constant loose habit [dress] Their limbs cleanly straight and of a convenient stature generally as plump as Partridges and saving here and there one of a modest deportment

Again, in 1774, Dr Benjamin Rush, of Philadelphia, once celebrated as America's greatest physician (but whose fantastic theories have long since been out-moded), during a meeting of the American Philosophical Society, delivered an oration described as *An Enquiry into the Natural History of Medicine among the Indians in North-America*, in which he explained that the Indians

multiply faster and die in smaller proportion than civilized nations      The Indians we are told were numerous in this country before the Europeans settled among them      Travelers agree likewise in describing numbers of both sexes, who exhibited all the marks of extreme old age      It is remarkable that age seldom impairs the faculties of their minds "

So runs the old story, closely echoed in one record after another      The settlers were convinced that the natives normally enjoyed marked good health—though seriously hurt by the diseases of the invaders

And yet the fact remains that the Indians suffered and died from many things besides old age      cold, heat, famine, disease, poison, and accident, and it is no shrewd guess if we allow for a good number of cripples among them      Unless they be professional beggars, the chronic invalids among any people, the deformed, the decrepit, do not usually appear in public, small wonder that the early settlers, describing perhaps truthfully what they saw, should see only the most presentable and active specimens of the Indian race

Still, the Indians appear to have been generally strong and healthy enough to cause envy in the white men      Their frequent forced exercise, their bodily exposure to fresh air and sunlight, their cleanliness (for the dirty Indian is probably a modern degenerate      there is plenty of evidence that the early Indians loved baths and swimming), their freedom from nervous stimulation, their abundant relaxation and sleep, could almost have forced good health upon them, and their contagious diseases seem to have been neither numerous nor, as a rule, deadly, until the settlers arrived, and the natives got their first taste of smallpox, measles, diphtheria, scarlet fever, yellow fever, venereal diseases, and many other serious infections

Josselyn says that their commonest afflictions were

pestilent Fevers, Plague, Black-pox      Consumption of the Lungs      Falling sickness      Kings evil      and the Disease called by the Spaniard the Plague in the back      with us Emphyema,

Dr Rush discusses various kinds of fever, pleurisies, pneumonia, rheumatism, dysentery, animal and vegetable poisons, wounds, and fractures, and he claims (wrongly) that gout was rare, worms and tooth ailments unheard of      Such vague summations as these do not help us much

It is from their remedies that we must make our soundest deductions      By surveying the medical practices of all the North American Indians, Dr Heber Youngken managed to compile the animal, vegetable, and mineral drugs used in more than eighty ailments      From Doctor Youngken's lists and from the pages of many early records, we can find at least fifty ailments known to the Indians of New England

A study of our lists shows clearly that, except for colds, some contagious skin diseases, and certain fevers (including malaria), the Indian ailments were largely organic, resulting, as much as anything, from improper nourishment and from accidental injury      Indian children frequently suffered from worms, toothaches, ear-

aches, and numerous stomach troubles common to all infants. Indian women had many female complaints, for which they knew a special set of medicines. The belief that the race was notably lethargic is well substantiated. They had only two or three sedatives (at least one of which was reserved for use by women only) as against some fifty stimulants and tonics.

All Indians had to fear burns, colic, constipation, deafness, debility, diarrhoea, dropsy, empyema, eye troubles, fevers, gland troubles, hemorrhages, malaria, mortification, various mouth ailments, nausea, neuralgia, nose ailments, miscellaneous aches and internal pains, piles, pulmonary troubles, rheumatism, sciatica, scrofula, scurvy, snake bites and other poisons, sprains, swellings, tooth ailments, tumors, urinary troubles, and (perhaps) some venereal diseases. But the greatest bulk of Indian remedies was for colds, wounds, skin ailments, stomach disorders, and female complaints.

3 *Some Superstitious Practices*—It is commonly the custom to dismiss all Indian medicine as being based on superstition. Perhaps the fact that the practitioners were often also priests has told against them in the opinion of scientific investigators. But the New England Indians apparently had nothing like those formal, elaborately organized priesthoods of the West and South which dominate most discussions of Indian cults and superstitions.

In New England there was a representative batch of superstitious medicines. Bloodroot (*Sanguinaria canadensis* L.) was used not only as a red dye for skin, clothing, and weapons, but also as a love charm. Juniper (*Juniperus communis* var. *depressa* Pursh) was regarded as "hot," and therefore useful in all manner of "cold" conditions. The broad teeth of moose fawns were hung about the necks of children when teething. Red Baneberry (*Actæa rubra* [Art.] Willd.) was used for pains in the stomach, but given in certain seasons only to males, in other seasons only to females. The variety of shell-fish (*Buccinum undatum* L.) from which white wampum beads were made was thought to be effective against hemorrhage. On the theory that so pliable a creature must cure stiffness by sympathetic contact, the skin taken from a living snake was bound about a rheumatic limb. A live toad, sewn in a bag and worn over a painful area, was thought to have "inhaled" the pain by the time he stopped wriggling. Warriors believed that if they removed the heart from a live turtle and swallowed it raw while still throbbing they would come through battle unwounded. Old people would trade as much as a valued beaver skin for that of a black wolf, since they considered the wolf's skin, worn as a coat, a sure protection against aches.

But just how much credence the Indians gave to these things we ought not pretend to know. Primitive sense of humor tends to exaggerate them for the benefit of civilized investigators.

At all events, a dozen or so superstitious remedies and prophylactics found in New England (and doubtless some others not yet found) are few enough when we recall our own pet fetishes, and we must not make the absurd blunder of confusing a man's superstition (which marks him as being only human) with his science and common sense (which, if he has any, marks him apart from most men). There is no evidence that the Indians made any such confusion. In their medicine, as stated by Whitebread, they "used faculties as discriminating and arrived at results as important and correct as those achieved by other races in a higher state of cul-

tural advancement " When an Indian fell sick, his friends and relatives might trot out their snake skins or organize a dance of hope for his recovery, just as a very pious family to-day might hold prayers for a stricken member, but, like any sensible family to-day, they would call in the doctor, and the Indian doctor had more in his kit than a few charms and fetishes, more in his head than the hocus-pocus he mumbled to impress the village

Doctor Youngken's lists indicate that for their eighty-odd ailments the Indians of North America knew over eight hundred specific remedies In New England alone we can count upward of two hundred remedies Nor should we ignore the fact that for every one we find there must have been many more, fully as useful to the Aborigines, which we shall never hear of

4 *Medical Practice*—In a sense, all the Indians practiced medicine That is, they had certain cherished methods for safeguarding health (among which easily the most popular was the sweat bath beginning in a sealed wigwam filled with hot stones and steaming kettles and ending in the cold waters of a nearby stream, a ritual in which one or many could participate) And when anyone cut his finger or felt a headache coming on, he knew just what to do about it

Each community, however, told off at least one member to specialize in the arts of medicine and pharmacy and to learn, preserve, and pass down their scientific traditions Some were believed born to the business, just how the birthright was detected is not clear In most tribes, especially those of the West and South, all prayers, songs, exhortation, suggestion, ceremonies, fetiches, and some specifics and mechanical processes were limited to the priest-doctors, the official medicine men and medicine women, whose art was magic and who formed extensive secret societies, with anyone eligible to join who gave public evidence, after private instruction, of his skill and fitness Here and there would appear self-appointed prophet-doctors, working alone and owing their "divine afflatus" to the thundergod Forming a third class, the herbalists, or lay doctors, many of whom were wise old women, were to be found everywhere, ready to combat the evil spirits of sickness with bleedings, operations, and medicines

That the herbalist was perhaps the only doctor regularly practicing in New England is suggested by all available records He was summoned for all serious cases, receiving payment in advance, unless he could trust the patient or his family—and receiving high payment the best in wampum and in goods the patient had to offer In hopeful cases, he resorted to his fund of medical knowledge, in hopeless cases, or when confronted by an ailment beyond his experience, he wisely turned to his God (nor should we sneer) When pressed, he would make a prognosis of the patient's recovery or death, sometimes consulting charms for information, in this he was rash, for it is said that a wrong prognosis meant the death of the doctor

After diagnosing the ailment, he would prescribe the proper treatment and medicines—which were the cheapest part of his service, for his materials were free for the taking in the forest

He knew how to deaden local pain with anesthetics and narcotics, how to combat poisons with antidotes and emetics, how to stop the flow of blood with styptics and prevent infection with antiseptics how to combat diarrhoea with astringents, constipation with cathartics (both mild and drastic), enemas, and suppositories, how to soothe with emollients, lotions, plasters,

poultices and salves and how to divert with liniments counter-irritants, and moxas, when to scarify when to puncture and bleed, when to use an inhalant when a splint and bandage when an injection (his syringe was constructed of an animal bladder and a hollow bone) Besides his scores of specific remedies, he had as general medicines carminatives, diaphoretics, diuretics, emmenagogues, expectorants, febrifuges, masticatories, parturients, prophylactics, sedatives, stimulants, stomachics, sympathetics, tonics and vermifuges he was even ready upon occasion to fill teeth Of childbirth he may not have had any direct experience since, as is well known, Indian women withdrew to bring forth their young like animals, in solitary confinement

He would usually compound his own medicines, though not necessarily, for every Indian seems to have been familiar with the native pharmacy He would often linger to administer the dose and otherwise tend his patient So the hard working medicine man was at once physician, pharmacist, and nurse (if not likewise a priest) No wonder, then, that in many communities he held a commanding position, frequently second not even to the sagamore himself

5 *Pharmacy*—The pharmacy of the Aborigines consisted of a very few processes requiring no long schooling to master

The Indian pharmacist had implements made of stone, wood, bone, and leather, designed for cutting, pounding, mixing, and boiling The New England Indian had no metal tools, unless (which was rare) he managed to import them from the luckier craftsmen of the Middle West

Easily the commonest of his preparations was the decoction, Doctor Youngken's lists call for some 230 His kettle was made of birch bark, or some other bark, and he would place it on coals, or hot ashes, or hot stones, but sometimes he would drop heated stones into the liquid to make it boil

Infusions, too, he commonly prepared, and likewise ointments (mixing the medicinal ingredients with animal fat or seal oil), plasters and powders (crushing or pulverizing the raw materials between two stones) And he was cunning in the skill with which he extracted oil from acorns and other nuts, first making a strong lye from the ashes of rotten maple wood, then boiling the acorns until the oil swam to the surface, whence it could be skimmed off and stored in bladders

Thus, simply, before the white men appeared, did the Indian compound the medicines which he had learned not from the theoretic pages of textbooks but rather by word and example directly from his immediate predecessors In his experience they proved capable of dealing with the ailments his people knew But the great blow was coming

6 *Conclusion*—During the years 1612 to 1619, smallpox and yellow fever came among the Indians of New England from the ships of English explorers These strange diseases swept through the villages of all the tribes, killing, some say, nine out of every ten, and some say nineteen out of every twenty After the worst of the attack was over, there were left of the Pennacooks a few hundred, of the Massachusetts less than a thousand, of the Wampanoags still less, and of the Narragansets and Pequods perhaps a thousand each These figures refer to total populations men, women, and children, the fighting forces were reduced to a mere handful for each tribe "So," wrote Governor John Winthrop in 1634 to his friend Sir Nathaniel Rice in London, "the Lord hath cleared our title to what we possess."

Thus, the Pilgrims landed to find little or no Indian menace—little, in fact, that boisterous Miles Standish could not meet single-handed In the course of the

next few decades (though struck heavily again by the plague in 1634) the surviving natives managed to regain something like their former courage and confidence, and to increase slightly in numbers, but until cheated and robbed and hounded by religious zealots, they were friendly with the whites, who, they thought, were responsible for milder winters they helped the settlers get acclimated, gave them food when they lacked it, showed them, in their desperate want of doctors and pharmacists, how to heal themselves. And if there was much magic mixed with their medicine, the Puritans knew enough to take the medicine and let the magic go.

We have seen that Indian medicine as practiced by the herbalists had but a small proportion of superstition mixed with it, especially in northeastern America, where the progressive pioneer spirit of the Algonquian Stock had not yet the time to settle into the decadence of ritual and tradition found in the older Southwest, on the contrary, it was largely guided by principles which we may almost with justice call scientific.

Now, there is one significant thing about Indian remedies which should not be neglected except for a mere half dozen special remedies and, of course, ointments and plasters involving a base as well as a therapeutic agent, the Indians always used a single, specific drug for a single ailment. Whether or not they had any influence, even indirect, on the development of medicine in Europe, they certainly set the colonists over here an impressive example in their use of simples, and it was during the century after the first settling that America began to lead the way in discarding the freakish polypharmacy which was our heritage from the ancient world and the Middle Ages.

It is true that the Indians may have had nothing whatever to do with this medical revolution, on the other hand, their practice may have suggested to the settlers and early American doctors and pharmacists the needlessness of demanding a dozen or a score of European ingredients, most of which were not at first to be had at any price, when one native ingredient would do the trick.

Records of an interchange of medical aid between the two races are of frequent occurrence, and typical is the contrast between the following treatments, mentioned by Josselyn:

"I have helped several of the *Indians*," he says, "with a Drink made of two Gallons of *Molasses* water (for in that part of the Country where I abode, we made out Beer of *Molasses* Water, Bran, chips of *Sassafras* Root, and a little *Wormwood* well boiled), into which I put of Oak of *Hierusalem*, Cat mint, Sowthistle, of each one handful of *Enula Campana* Root one Ounce, Liquorice scrap'd bruised and cut in pieces one Ounce *Sassafras* Root cut into thin chips one Ounce, Anny seed and sweet Fennel seed of each one Spoonful bruised boil these in a close Pot, upon a soft Fire to the consumption of one Gallon then take it off, and strain it gently, you may if you will boil the strained liquor with Sugar to a Syrup, then when it is Cold, put it up into Glass Bottles and take thereof three or four spoonfuls at a time letting it run down your throat as leasurably as possibly you can, do thus in the morning, in the Afternoon, and at Night going to Bed."

But later he speaks of a fisherman, one Christopher Luxe, who had "burnt his Knee Pan" and was healed by an Indian wife she stopped the pain by dropping on the sore a strong decoction of alder bark, then she made a plaster by boiling the bark of white pine until it was soft, stamping it between two stones until it was as thin as brown paper and of the same color, and incorporating it with seal's oil, thus she applied warm to the burn.



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But if the Indians had any real effect upon our medicine, our doctors were not apparently aware of it. In his Oration of 1774, Doctor Rush winds up with a general estimate "We have no discoveries in the *materia medica*," he asserts,

' to hope for from the Indians in North America. It would be a reproach to our schools of physic, if modern physicians were not more successful than the Indians, even in the treatment of their own diseases "

' Since the intercourse of the white people with the Indians, they have acquired several of our artificial methods of curing diseases, particularly the art of phlebotomy. What Indian remedies ever equalled the efficacy of bleeding "

The answer lies in the fifty-six Indian drugs which Doctor Youngken lists as being still recognized either in the *United States Pharmacopœia* or in the *National Formulary*. Of these, the following thirty were used by the Indians of New England

American Hellebore, Arbor Vitæ, Beth Root, Blackberry Root Bark, Black Snakeroot, Bloodroot, Blue Cohosh, Blue Flag, Boneset, Butternut Bark, Canada Snakeroot, Dogwood, Elder Flowers, Geranium, Lady's Slipper, Larch Agaric, Life Root, Lobelia, May Apple, Pipsissewa, Pleurisy Root, Poke Berry, Scullcap, Spikenard, Turpentine, Verbena, White Oak Bark, Wild Black Cherry, Witch hazel and Yellow Dock.

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## DR HUGH S CUMMING RETIRES AS SURGEON GENERAL

Surgeon General Hugh S. Cumming who joined the Public Health Service in 1894 and became Surgeon General in 1920, retired February 1st

Dr. Cumming's influence in the control and treatment of the Bubonic Plague and Yellow Fever has been world wide and he was active in promoting international sanitation treaties. The Surgeon General was tendered and received many decorations from various countries and under his direction the Public Health Service has grown to be a bureau of much influence. He was born in Hampden, Va., sixty six years ago, and graduated from the University of Virginia Medical School in 1893.

It is stated that Dr. Thomas H. Parran, Jr., New York State Health Commissioner, will succeed Surgeon General Cumming; he is a native of Maryland and a graduate of Georgetown University.

Miss Anna M. Pabst, bacteriologist at the National Institute of Health, Washington, D. C., gave her life to science when she died in Emergency Hospital of a form of meningitis contracted while trying to develop a serum with which to combat the disease in others.

Miss Pabst, an experienced technician, was inoculating an animal with meningitis culture on December 17th when the animal moved and some of the culture squirted into her eye. Though all possible immediate steps were taken to cleanse the eye from the deadly injection, Miss Pabst contracted the disease.

The Public Health Service in reporting her death in line of duty, paid highest tribute to the

scientific service of Miss Pabst. Hers is the sixth death in the past 10 years from diseases contracted in that laboratory by scientists. Many have suffered serious illnesses.

Miss Pabst came here from Brooklyn, N. Y., some years ago. She received her preliminary education in New York City and later received a master's degree in bacteriology at George Washington University, where at the time of her death she was working toward her doctor's degree in the same subject.

Col. Charles H. March, Litchfield, Minn., has been appointed to serve as chairman of the Federal Trade Commission for the fiscal year 1936, effective January 1st; he succeeds Commissioner Edwin L. Davis. This will be Colonel March's second term as chairman of the commission. He was appointed in 1929 for a term expiring September 25, 1935 and was reappointed by President Roosevelt last September for a full term of seven years expiring in 1942.

## SOUTHERN METHODIST LIBRARY BUILDING

The \$400,000.00 Fondren gift provides Southern Methodist University with a new library building. The *Dallas News* comments: Mr. and Mrs. W. W. Fondren of Houston, already material benefactors of the local university, have made a splendid gift in the library building. It is to be hoped that the structure's plans avoid mistakes made elsewhere and provide adequate means for expansion as S. M. U. grows. Such a building becomes the foundation for future greatness in the field of higher education.

# THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS  
DEPARTMENT

Commenting upon recent discussions, publications and proposed, as well as present legislation, pertaining to Fair Trade Practices, the writer believes that our "real" hope lies in national legislation

This is the opportune time for the small business man to present his problem to the members of the Seventy-fifth Congress. The little fellow up to this time, has been standing by waiting for "George to do it" instead of taking an active part in promoting matters that may help him and his business, and when things go wrong he is the first to complain.

A program that will make the individual store owner fall in line with present proposed legislation would do much toward more favorable results. We all thought that Drug Institute would be the solution, but no doubt, it failed because of lack of coöperation from retail druggists who needed help.

Since reading Mr. Olsen's article, the New York high court has ruled the Fair Trade Act of that state unconstitutional. Similar rulings can be expected in states where these acts already exist and in states where such bills are in progress.

Many manufacturers have found it difficult to enforce their minimum suggested resale prices and in many communities the minimum resale price has become the regular retail price. Chiseling and the use of loss leaders has very often resulted in detrimental effects upon the manufacturer and wholesaler as well as the retailer.

In view of the many difficulties that are now confronting small businesses, and the difficulties that may arise from local and state legislation in which interstate traffic plays an important role, why not put a united effort behind National Fair Trade and Anti-Discrimination Legislation? Include all fields of distribution so that the "opposition" cannot call it class legislation. Our Social Security Program is designed to give relief to those in need so why not present our problem to the administrators of this act?

Awaken the little fellow and line him up with his local, state and national organizations that have already started the ball rolling in a direction that should result in fair and honest business ethics.—H. W. HEINE <sup>1</sup>

## STATE FAIR TRADE ACTS

BY PAUL C. OLSEN <sup>2</sup>

State Fair Trade Acts which permit resale price agreements between owners of trade-marked merchandise and their wholesale and retail distributors now exist in ten states. These ten states contain nearly 25,000 of the 58,000 drug stores in the United States. The California law was passed in 1931, but in the other nine states the laws were enacted this year. These states are Oregon, Washington, Iowa, Wisconsin, Illinois, New York, New Jersey, Pennsylvania and Maryland.

In attempting to effectuate these acts, a number of problems have arisen. The solution of these problems satisfactorily is difficult and complex in many cases. It is the purpose of this paper to enumerate some of the difficulties which have been encountered so far in efforts to make these laws accomplish the purposes for which they are intended. It is believed an understanding of these difficulties and problems may serve as some assistance in determining just what can be accomplished by these laws.

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<sup>1</sup> Extension Department, Purdue University

<sup>2</sup> Philadelphia College of Pharmacy and Science

1 The laws all authorize resale price agreements on trade-marked merchandise. The question has arisen of what is "trade-marked" merchandise. Trade-marks are used for purposes of identification, but the identification in some cases extends to the manufacturer of the article, while in other cases it does not.

2 May the owner of trade-marked merchandise or the owner of the trade-mark, or both, enter into resale price agreements with their distributors? A possible condition such as this can arise. A manufacturer of trade-marked cigarettes may be unwilling to make resale agreements with his distributors. May a wholesaler who buys these cigarettes from this manufacturer make resale price agreements on these cigarettes with his retail customers?

3 The resale price agreements authorized under the state fair trade acts can, of course, apply only to intrastate commerce. Suppose a retailer or wholesaler buys some merchandise from within the state under a resale price agreement, and also buys identical merchandise outside the state, which of course puts this merchandise into interstate commerce. Is the resale price agreement binding on all this merchandise, or only on that part of it which is bought within the state?

The various fair trade acts attempt to cover this situation by providing that any sale within the state at a figure below the agreed resale price constitutes unfair trade. This provision, however, has not been acted upon as yet by any court of final jurisdiction.<sup>1</sup>

4 Indeed the whole question of the binding nature of resale price agreements upon persons who have not signed agreements is still in the courts of California. A Supreme Court decision from that state is expected momentarily.<sup>1</sup>

5 Are resale price agreements setting different minimum prices on the same products permissible? The general interpretation is that the lowest contracted resale price is the one which controls all resale prices. This means, of course, that uniform resale prices throughout an entire state are established.

It may be argued that these uniform prices are merely minimum resale prices, but the experience of California has been that the minimum resale price tends to become in all stores the prevailing price.

6 An important purpose of state fair trade acts has been to establish minimum resale prices which eliminate loss leader selling and its unfair and undesirable economic and social consequences. In California minimum resale prices on popular merchandise have been established in many cases at figures far below the traditional  $33\frac{1}{3}$  per cent gross margin on the retail selling price, and these minimum resale prices have been accepted with enthusiasm in California according to trade reports from there.

In the other nine states, however, vigorous objection has been made to the establishment of minimum resale prices for retailers which allow to the drug trade less than the traditional  $33\frac{1}{3}$  per cent margin on the selling price. The difficulties

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<sup>1</sup> The New York Court of Appeals has since invalidated that part of the New York Fair Trade Act which would bind distributors not signing resale price contracts to maintain the resale prices specified in contracts. The effect of this decision is to permit resale price agreements within the state of New York between owners of trade-marked merchandise and the distributors of this merchandise but not to make these resale prices binding on persons not signing resale price agreements.

in these states of manufacturers formulating contracts satisfactory to their retail distributors thus can be imagined

7 Since the state fair trade acts can apply only to intrastate commerce, it follows that a manufacturer who desires to make contracts for resale prices with his wholesale and retail distributors must be domiciled in that state. This places a burden upon many manufacturers who do not maintain branch offices or warehouses in each of the ten states having fair trade acts. Indeed were they to domicile themselves in these ten states they would be burdened not only with the costs of maintaining branch offices in each state, but also would subject themselves in many of these states to local taxes of various types which they do not now have to pay. The problem will be further complicated, of course, as additional fair trade acts are enacted in other states. A fair trade act is now before the Alabama legislature and another is having the consideration of the Tennessee legislature. When the Ohio legislature meets in special session this fall, a fair trade act, it is expected, will be introduced there.

8 As a substitute for direct contracts between manufacturers and their whole sale and retail distributors, the so-called wholesalers' omnibus contract has been put in use in California and has been suggested in other states. While these contracts solve some of the difficulties, they still leave unsettled the question of whether or not wholesalers may include in their omnibus contracts merchandise on which manufacturers have indicated no desire for resale price agreements.

Also unsettled is the situation of the many wholesalers who do an interstate business.

I have raised these questions not because of any unfriendliness toward the purpose of fair trade acts, but simply because I believe in raising these questions so that a better understanding will be had of the difficulties which are inherent in effectuating the purpose of these laws.

As I have indicated above, selling merchandise at a loss for purposes of destroying competition and creating monopoly is undesirable, both from an economic and a social standpoint. Fair trade acts, capably and carefully administered, offer a means of progress toward this very desirable end—the elimination of unfair and predatory practices in wholesale and retail distribution.

Retailers should not forget that the responsibility for the success of state fair trade acts is largely theirs. It is manifestly impossible for a distant manufacturer or even for a wholesaler to detect violations of resale price agreements. The successful enforcement depends upon the attitude and action of retailers in their enforcement.

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#### AMENDMENT OF SECTION 2 OF THE CLAYTON ACT

Proposed changes by the Senate Judiciary Committee seek to amend Section 2 of the Clayton Act. The amendment deals with price discriminations and terms of sale. There is evident interest in measures which seek to make effective prevention of unfair price policies by national and state legislation and it is

to be hoped that as a result of these discussions regulations will be formulated which will be fair and enforceable.

The proposed changes place important restrictions upon the extent to which savings made possible by large scale purchasing can be passed on by the distributor to buyers. Furthermore, the Federal Trade Commission would be empowered to establish limits beyond which quantity prices could not be lowered.

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# PROCEEDINGS OF THE LOCAL BRANCHES

## CHICAGO

The 234th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held January 21st, at the University of Illinois College of Pharmacy. The meeting was called to order by President Morrison.

As this meeting closed the thirtieth successful year of the Branch the order of business was a report of the secretary on the financial condition of the Branch and the recommendations of the nominating committee for officers for the coming year.

The secretary's report was voted as accepted and it was voted that a unanimous ballot be cast for the officers presented by the nominating committee. Dr. Lanwermyer escorted the newly elected officers to the chair.

The speaker for the February meeting was announced as Dr. Ralston of Detroit, who discussed "Hormones or Endocrines."

Prof. E. N. Gathercoal, Chairman of the Revision Committee of the National Formulary VI, was introduced as the speaker of the evening.

The title of the discussion was "New Things in the National Formulary VI and United States Pharmacopoeia XI." The following is a summary of the discussion.

A brief review was given of the "Principles of Revision" of the U. S. P. and N. F.

The basis of admission to the U. S. P. is the best drugs or medicines of known therapeutic value that are being used at the time of revision, while the basis for admission to the N. F. is extent of usage, regardless of the consensus of the best thought of the medical profession as to therapeutic value.

Professor Gathercoal pointed out that the two official books were serving definite fields and that one book should not be looked upon as a supplement to the other.

To gain a clear idea as to what drugs and preparations should be given a place in the N. F. careful consideration was given to the facts obtained from three surveys. These surveys included (1) drug stores, (2) new things druggists thought might be included, (3) the reading of prescriptions to find out what doctors were prescribing.

Two rules were established: (1) that the drug or preparation must be used in 20% of the drug stores; (2) that they must be used once in every ten thousand prescriptions.

The U. S. P. XI includes the addition of ten biologicals. Destearinated Cod Liver Oil, Solution of Ergosterol, while not admitted, a lengthy discussion has taken place on Vitamins B and C and these substances are still being studied by the committee.

Liver Extract, the solution and the purified solution for hypodermic use, were included as well as Parathyroid and Dried Stomach.

No crude vegetable drugs were added to the U. S. P. while six were added to the N. F.

Among the N. F. inclusions are Psyllium Seed, Chimaphila and Areca for veterinary purposes, Calamus and Sage. The latter two were included solely on usage.

There were about twenty chemicals added to the U. S. P. Some of the most outstanding ones are Sodium Perborate, Calcium Gluconate, green Iron and Ammonium Citrate and Histamine Phosphate. The solution of the last mentioned chemical is used mainly as a diagnostic test for gastric acid secretion. Two others are now official in the U. S. P., one for pharmaceutical purposes and one for anesthesia.

The N. F. has added several chemicals. In order to do this a radical change in scope had to be made.

The policy of the N. F. has been to include only formulas and simples that entered into these formulas. Now simples are added regardless of their usage in preparations. Chlorothymol has been added as it now enters Liquor Antisepticus. This addition to the well known preparation has been made in order to give it a higher antiseptic value. It should be noticed that Liquor Antisepticus is now an assay preparation. Its assay is based on the length of time that it takes to kill *Staphylococcus aureus*. Other chemicals added to the N. F. are Gentian Violet, Potassium Guaiacol Sulphonate, the Phosphates of Iron, Quinine and Strychnine, Scarlet Red, Potassium and Sodium Thiocyanate.

Preparations added to the U. S. P. are Emulsion of Liquid Petrolatum, Mild Tincture of



Iodine Iodized Oil, small Tablets of Bichloride of Mercury, Diluted Erythryrityl Tetranitrate and Solution of Histamine Phosphate

Some of the outstanding preparations added to the N F are Elixir of Aminopyrin Elixir of Barbital, Elixir of Phenobarbital, Elixir of Sodium Thiocyanate, Aqueous Elixir and Iso-Alcoholic Elixir

The Iso-Alcoholic Elixir consists of two elixirs that can be mixed in such proportions as to give a desired alcoholic strength This elixir can be used advantageously as a vehicle or diluent for high alcoholic Fluidextracts or Tinctures and as a solvent for simples insoluble in alcohol and soluble in water or vice versa

Professor Gathercoal prepared a very extensive outline showing a comparison of the N F V and VI as regards the number of items in each class, N F V items not admitted to N F VI, new admissions to the N F VI, occurrences per 10 000 prescriptions and loss and gain per 10 000 prescriptions by the revision

The outline also shows the percentage of use in prescriptions of U S P items, N F items unofficial items and proprietary items This outline may be had by writing to Professor Gathercoal or the Secretary of the Branch, L Templeton, 715 S Wood St., Chicago, Ill

At the conclusion of the discussion, halted only by the lateness of the hour, a lively discussion followed, with many questions being asked regarding the new preparations

All of the new preparations were exhibited and small wooden spoons were furnished so that the preparations could be tasted Much favorable comment was elicited on the revised formula for Syrup of Glycyrrhiza

Many timely remarks were made by Messrs Fantus Sisson, Gray, Becker, Lanwermyer, Nelson and many others whose names do not appear

It is suggested by the secretary that those further interested in any of the additions or changes of the two books confer with Professor Gathercoal, 715 S Wood St., Chicago, Ill

L TEMPLETON, *Secretary-Treasurer*

#### COMPARISON OF N F V AND N F VI AS REGARDS

	No of Items in Each Class in			N F V Items Not Admitted to N F VI	New Admissions to N F VI	Occurrences per 10 000 Prescriptions			
	N F	N F V	N F VI			Total N F V	Total N F VI	Loss	Gain
Crude drugs	0	142	110	58	26	9 65	16 76	0 81	7 92
Animal drugs	0	5	10	1	6	0 00	94 90	0 00	94 90
Chemicals	0	67	95	18	46	120 62	896 71	8 22	784 31
Total simples	0	214	215	77	78	130 27	1008 37	9 03	887 13
Elixirs	86	66	54	21	7 + 2*	743 15	905 55	3 45	165 85
Liquors	41	37	32	17	12	128 19	225 97	2 02	99 80
Spirits	12	11	10	1	0	42 40	42 40	0 00	0 00
Syrups	35	38	25	21	8	159 06	251 45	0 81	93 20
Waters	3	2	5	0	3	12 46	16 96	0 00	4 50
Total solution preparations	177	154	126	60	30 + 2*	1085 26	1442 33	6 28	363 35
Extracts	2	14	14	7	7	28 30	90 02	2 38	64 10
Fluidextracts	52	105	72	44	11	36 28	57 31	1 47	22 50
Fluidglycerates	0	6	1	5	0	0 00	0 00	0 00	0 00
Infusions	2	4	3	2	1	5 40	14 20	0 00	8 80
Oleo-resins	0	1	3	0	2	0 00	0 58	0 00	0 58
Resins	0	0	2	0	2	0 00	0 08	0 00	0 08
Tinctures	33	56	47	18	9	100 59	134 66	4 23	38 30
Vinegars	1	1	0	1	0	0 00	0 00	0 00	0 00
Wines	12	0	0	0	0	0 00	0 00	0 00	0 00
Total extractive preparations	102	187	142	77	32	170 57	296 85	8 08	134 36

Oleosaccharates	1	1	1	0	0	3 80	3 80	0 00	0 00
Pills	22	24	13	14	3	2 93	5 60	0 48	3 15
Powders	15	13	7	8	2	17 88	20 50	0 08	2 70
Salts	10	10	10	0	0	2 43	2 43	0 00	0 00
Tablets	0	8	48	5	45	10 44	565 52	1 28	556 36
Troches	0	2	1	1	0	0 00	0 00	0 00	0 00

Total solid preparations for internal use

48 58 80 28 50 37 48 597 85 1 84 562 21

Cerates	1	3	2	1	0	1 18	1 10	0 08	0 00
Collodions	4	3	2	1	0	0 08	0 08	0 00	0 00
Dressings	0	1	1	0	0	0 00	0 00	0 00	0 00
Glycerogelatin	0	5	1	4	0	0 00	0 00	0 00	0 00
Liniments	8	10	9	2	1	7 03	7 45	0 08	0 50
Lotions	4	7	6	2	1	54 93	56 20	0 33	1 60
Mulls	0	5	0	5	0	0 00	0 00	0 00	0 00
Oleates	4	2	0	2	0	0 00	0 00	0 00	0 00
Pastes	0	8	8	4	4	28 40	28 73	0 00	0 33
Petroxolins	0	18	3	15	0	1 34	1 18	0 16	0 00
Plasters	3	2	1	2	1	0 08	0 70	0 08	0 70
Ointments	5	19	21	3	4 + 1*	14 34	36 04	0 00	21 70

Total preparations for external use

29 83 54 41 11 + 1\* 107 38 131 48 0 73 24 83

Acids	2	2	2	0	0	6 00	6 00	0 00	0 00
Ampuls	0	8	29	0	21	1 41	2 07	0 00	0 66
Confections	0	2	0	2	0	0 66	0 00	0 66	0 00
Emulsions	11	6	4	3	1	3 54	3 46	0 16	0 08
Gargles	0	1	1	1	1	0 00	0 00	0 00	0 00
Gelata (jellies)	1	0	1	0	1	0 00	5 90	0 00	5 90
Glycerites	7	5	6	1	2	0 41	0 66	0 00	0 25
Mels	0	2	1	1	0	0 08	0 08	0 00	0 00
Mixtures	19	13	4	7 + 2*	0	75 33	71 25	4 08	0 00
Mucilages	3	2	1	1	0	0 08	0 08	0 00	0 00
Nebula (sprays)	0	5	4	3	2	0 08	80 88	0 00	80 80
Oils (preparations)	3	6	4	2	0	0 70	0 00	0 70	0 00
Species (teas)	3	3	0	3	0	0 08	0 00	0 08	0 00
Suppositories	0	1	1	0	0	0 40	0 40	0 00	0 00
Other miscellaneous	27	27	14	15 + 1*	3	34 04	58 96	0 08	25 00

Total miscellaneous preparations

76 83 72 39 + 3\* 31 122 81 229 74 5 76 112 69

Total preparations	432	565	474	245 + 3*	154 + 3*	1523 50	2698 25	22 69	1197 44
Total monographs	432	779	689	322 + 3*	232 + 3*	1653 77	3706 62	31 72	2084 57

\* Titles have been changed so that the items are in other groups, but these are not new preparations

## OCCURRENCES IN PRESCRIPTIONS

	U S P VI 1886	U S P X N F V 1931	U S P XI N F VI 1936 *
U S P items	88 2%	65 19%	63%
N F items		7 92%	17%
Official items	82 2%	73 11%	80%
Unofficial items	9 2%	10 84%	4%
Proprietary items	2 6%	16 05%	16%
	94 0%	100 00%	100%

\* Based on the 1931 prescription ingredient survey but only approximate figures

## AMERICAN PHARMACEUTICAL ASSOCIATION, CHICAGO BRANCH

The following is a list of the officers for the Chicago Branch elected at the last meeting  
*President* S W Morrison, *1st Vice President*, H M Emig *2nd Vice-President*, R A G Linke,  
*3rd Vice-President* O U Sisson *Secretary Treasurer* L Templeton, *Delegate to the House of*  
*Delegates*, L Templeton *Committee Chairmen* *Membership*, Thos E Rylands, *Legislation*,  
 J Reimenschneider, *Practice*, I A Becker *Medical Relations*, Dr Bernard Fantus, *Publicity*  
 A E Ormes

LAWRENCE TEMPLETON, *Secretary Treasurer*

## NEW YORK

The January meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSO  
 CIATION was held in Columbia University College of Pharmacy, on January 13, 1936

About one hundred members and their guests attended

The meeting was called to order by President Ballard The secretary read the minutes  
 of the previous meeting These were approved as read The report of the treasurer Mr Currens  
 was submitted by letter

Chairman Lehman of the Nominating Committee then reported as follows *President*,  
 Frederick C A Schaefer, *Vice President*, Otto F A Canis *Secretary* Horace T F Givens,  
*Treasurer* Turner F Currens *Chairmen of Committees* *Education and Legislation*, Robert  
 S Lehman, *Progress of Pharmacy* Leonard W Steiger, *Professional Relations*, James H Kidder  
*Audit* Ernst A Bilhuber, *Membership* Rudolf O Hauck *Secretary of the Remington Honor*  
*Medal Committee and Delegate to the House of Delegates* Hugo H Schaefer *Delegates to the N Y*  
*Pharmaceutical Council* Samuel C Henry, Frederick C A Schaefer *Alternate Delegates to the*  
*N Y Pharmaceutical Council*, Jacob Seley John J Corcoran

Chairman Ligorio of the Membership Committee reported as follows

This committee has busied itself during the past year with increasing the membership of  
 the Local Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION and that of the mother organi  
 zation

In all 14 new members have been added to the list, ten of which joined the A PH A and  
 four the Local Branch

A series of circumstances prevented the chairman from performing his duties during the  
 entire year The credit therefore, belongs to those loyal colleagues who are ever on the alert  
 and who never cease preaching the gospel of organization work

In commenting upon the subject of membership, it would seem that time is ripe for  
 certain changes to be recommended The entire subject should be studied thoroughly and should  
 be made as Mr Ziefe, Chairman of the Membership Committee of the A PH A has pointed  
 out a major part of the ASSOCIATION'S activities It should be followed as a well organized and  
 systematic effort on the part of the ASSOCIATION itself, from the President down, rather than as a  
 mere committee routine

' Through judicious and well correlated activities every pharmacist in the country should  
 be made to realize that membership in the A PH A and local Branches is synonymous with high

professional standing The work of the American Chemical Society is a worthy example of such activities In a very few years they have made the chemists of the country organization-conscious, even to the point that large chemical and chemical engineering organizations do not employ men who are not members of the A C S

"A second suggestion is that in some way membership in the Local Branch should be automatic upon joining the National Association, the question of refunds to the Local Branch to be worked out in time This would eliminate the objection of talking A P H A at one time and later Local Branch "

Chairman Kidder, of the Professional Relations Committee, reported that he had noted in professional papers comments on increased relations between doctors and pharmacists, and that the new U S P will serve as a major weapon in bringing the physicians to write U S P and N F prescriptions

Chairman Lehman, of the Committee on Education and Legislation, presented the following report

"Last report on the Copeland Bill, S 5, indicates that the House Committee on Interstate and Foreign Commerce will meet shortly to consider the measure

' Senator Van Nuys, of Indiana, expects to introduce an Interstate Commerce Bill, which will modify the law considerably and will permit those engaged in interstate commerce to make price maintenance contracts where they are permitted under the state law

"The Patman anti discrimination bill demanding equal prices for all distributors is also being pushed

"Tincture of Ginger U S P is still classified as an intoxicating liquor and may only be sold when meeting the requirements surrounding the sale of liquor It may not be prepared by a pharmacist, the bottle must bear internal revenue stamps

"Pay Roll Tax —A treasury decision recently issued requires that an employer must keep such permanent records of remuneration as paid to his employees, even though he does not come under the provisions of the law, *i e*, if he has less than the minimum number of employees Exemptions include the services of children under the age of 21 years in the employ of their parents, husband or wife in the service of either, also domestic servants

"A congressional committee is inquiring into the American Retail Federation Hearings were resumed on Dec 30th, when Representatives Patman and Lucas interrogated several of the Department store and Chain organizations

"A federal business census began on January 2nd, and pharmacists may expect to be visited shortly by representatives of the Census Bureau It is to be hoped that the information obtained may be used to further beneficial legislation

"The Court of Appeals of the State of New York has invalidated the Section 2 of the N Y State Fair Trade Law, by declaring that section as unconstitutional That is the section binding non signatories to the terms of the contracts entered into by the manufacturers and retailers The court does not forbid the right of a manufacturer to enter into resale price contracts with wholesalers and retailers The right of a manufacturer to adopt a refusal policy is upheld So although the law is weakened, it will be a powerful protection in the hands of sincere manufacturers to the distributors

"The Drug Institute finally disbanded, it is very much to be regretted that the considerable sum which was raised could not have been used for the improvement of conditions "

Samuel Henry, delegate to the New York Pharmaceutical Council, reported that he had attended all meetings of the Council and expected to continue to do so and that he had at all times maintained the dignity of the New York Branch He wished the members to know that the Council is doing some very fine work

Under the heading of old business Dr Ballard reported that he had replied to Professor A Zieffe stating that the New York Branch is in accord with his program and that for over twenty-five years we have maintained an active and strong branch with meetings well attended enclosing a list of programs for the past half year

Dr Fischels as a member of the Council, reported that the Council had the matter of remitting dues for Branch members under advisement

Dr Ballard turned to nominations for officers and requested further nominations Dr Fischels moved that the nominations be closed and the committee report be accepted, seconded

by Dr Arny and carried. The new officers were elected by unanimous vote and Dr Ballard called the new president, Frederick C A Schaefer to the chair and introduced the newly elected officers to the meeting.

Chairman Steiger of the Committee on the Progress of Pharmacy, reported

The following review of important advances during the year 1935 in sciences related to Pharmacy are from *Science News Letter Industrial and Engineering Chemistry* and the *News Edition* of the latter journal *Medical Sciences (Science News Letter 12/21/35)*. The virus, that causes the plant disease tobacco mosaic, was isolated by Dr W M Stanley Rockefeller Institute Princeton N J, as a crystalline protein.

Identification of the virus of human influenza and its cultivation outside the body were reported by Drs Thomas Francis Jr and T P Magill of the Rockefeller Institute.

"First definite evidence of a vitamin participating directly in a physiological process was found by Dr George Wald, Harvard University who found vitamin A in the eye's retina and active in vision.

Relief and apparent cure of a fatal type of high blood pressure by surgical operation was reported by a number of surgeons working independently and using different surgical techniques, among them Dr Alfred W Adson Mayo Clinic Dr Max M Peet University of Michigan Medical School, Dr Irvine H Page Hospital of Rockefeller Institute for Medical Research, and Dr George J Heuer New York Hospital.

A substance that can be applied to the outside of teeth to relieve pain during drilling and other dental procedures was announced by Dr L L Hartman Columbia University.

Heart muscle tone is the chief factor influencing the blood flow through the heart's arteries and should be considered in prescribing drugs for heart disease due to occlusion of these arteries. Dr William B Kountz Washington University School of Medicine, reported.

Choline produced by the pancreas is a vitamin essential for liver function and probably an important factor in control of diabetes. Dr C H Best co discoverer of insulin and Dr M Hershey and Miss M E Huntsman all of the University of Toronto, found.

A new hormone enterogastrone produced by the upper intestinal walls which may aid treatment of stomach ulcer because it inhibits stomach activity was announced by Prof A C Ivy, Northwestern University Medical School.

Synthetic production of male sex hormones was reported by Dr L Ruzica Zurich Switzerland.

Evidence presented by Dr L G Rowntree and colleagues indicates that extract of pineal gland causes precocity of sexual development and premature cessation of body growth.

'A slight drop in the cancer death rate appeared in life insurance statistics for the first nine months of 1935.

Length of life can be predicted by measuring change of the eye lens power of accommodation early presbyopia indicating probability of a shorter than average life. Dr Felix Bernstein Columbia University found from research on thousands of individuals in Germany.

Important aid for the treatment of liver disease and for preparing patients suffering from fatty livers for operation was the discovery by Drs J L Bollmand and F C Mann, Mayo Clinic that the composition of the liver can be varied within wide limits by diet.

Cause of the paralytic disease multiple sclerosis may be clotting of blood in the small veins of the brain possibly as a result of infection. Researches by Drs Philip Solomon Mary E Dailey and Tracy J Putnam Harvard Medical School indicated.

Putting a specially prepared fat or olive oil mixture into the veins is a new method developed by Drs L Emmett Holt Jr Herbert C Tidwell and T F McNair Scott, Johns Hopkins Hospital for treating babies suffering from severe nutritional disorders.

A new function of the pituitary gland control of the reticulo endothelial system, which is concerned with production of new blood cells and destruction of old ones was indicated in experiments of Prof E C Dodds Courtauld Institute of Biochemistry and Dr R L Noble London.

Vitamins (*Ind Eng Chem*, Jan 1936). In the field of foodstuffs the most important advances of the year have been in the commercial materialization of researches on the vitamins. Vitamins C and B<sub>1</sub> are now available on the market in crystalline form, a tremendous advance over previous concentrates. Vitamin C has been synthesized from sorbitol (derived from dextrose) through sorbose and is available in quantities to meet all demands. Other processes of synthesis

have also been applied to yield ascorbic acid (vitamin C) commercially, but the method based on sorbitol has so far given easier and cheaper production in larger quantities. Vitamin B<sub>1</sub> in crystalline form has been commercially obtained from rice polishings by a long and careful process of concentration which yields only about 3 to 5 Gm. of crystals from a ton of raw material. Need less to add the extraction of so delicate an organic compound is an achievement of the highest order and despite the tiny quantities entitled to be called commercial, opens up the possibility of successful synthesis later.

Much accumulated information regarding the vitamins and hormones has during the year forecast their possible production through synthetic methods in the near future. The structure of vitamin B<sub>1</sub> was determined and announced early in 1935 as a result of its isolation in crystalline form, but as yet a complete synthesis has not been developed.

'Investigations of Reasons for Remarkable Healing Effects of Blowfly Maggots (*News Edition*, 12/20/35). One of the objects of the work with blowfly maggots which are being used extensively by surgeons in the treatment of infected bones or wounds, has been to determine how the maggots produce their remarkable healing effects. In addition to removing diseased tissues it has been found that the maggots excrete certain substances into the wound and that one of these allantoin stimulates healing. Allantoin is available commercially and is now being used by doctors with gratifying results.

'Another substance excreted by the maggots has been found though not yet identified, which in laboratory tests killed certain disease causing bacteria in 5 to 15 minutes without injuring human tissues.

'*Medicine (Ind Eng Chem, Jan 1936)* In medicine important new developments in addition to the vitamins which play so large and growing a part in modern healing have received special attention. A new method of immunizing against tetanus avoids the danger of serum sickness from the antitoxin and a new sulphohydryl compound, thioglycerol promotes the healing of obstinate wounds and sores. Somewhat related to medicine, but more especially to physics has been the discovery not yet fully worked out for application, of a method of imparting radio activity of relatively short life to sodium compounds. The effect of this technique for the artificial production of radioactivity through electrical bombardment is likely to be far reaching in many fields as details are developed."

President Schaefer then introduced Chairman E. Fullerton Cook, *Chairman* of the U. S. P. Revision Committee, the guest speaker of the evening, who discussed the U. S. P. XI. The complete text of his address follows:

An Efficient Medicine for Every Therapeutic Need. About a generation ago a new therapeutic era was ushered in under the stimulus of a group of earnest clinicians and pharmacologists who were greatly influenced by the relatively new evidences of drug action or inaction through animal experimentation.

By some critics this group was termed therapeutic nihilists since they questioned the value of most drugs in the prevention or treatment of disease. One prominent clinician believed that only about a half dozen drugs were worthy of consideration since their physiologic activity could be demonstrated chemically or biologically.

Under the brilliant and able leadership of Dr. Osler the chairs of therapeutics were driven from most of the medical colleges and it has taken years to return to a reasonable and sound restoration of this important branch of medicine.

'This process was revolutionary in nature and like all revolutions the proponents swung far to the left, questioning all traditions and impericisms. Again history repeats itself and medicine is rediscovering the importance for therapeutics but basing this acceptance upon clinical evidence and scientific proof.

Tremendous advances have been made in the efficiency and specific character of many medicines during this period, and the thousands of trained investigators in colleges and universities, in heavily endowed medical research institutions in the research laboratories of a few of our pharmaceutical and chemical manufacturing firms, give much promise for the future.

"During this revolutionary period the Pharmacopoeia has kept pace with every development and the Eleventh Revision represents the clear cut policy of its founder, Dr. Spalding who, in 1820 stated that a Pharmacopoeia to properly function must recognize the important medicines of its day. Unfortunately a few important medicines are excluded from the U. S. P. XI by the

unwillingness of patentees to have their products included Insulin and pentobarbital are in this group It has been the policy of the present Committee of Revision to include a medicine for every therapeutic need when such is available

"The New National Formulary contains preparations and standards for a number of these U S P medicinal substances especially as tablets or in parenteral solutions, or in nasal and throat preparations and elixirs

"The U S P has taken the theoretical position that it should supply efficient therapeutic agents in such simple form that the physician could combine them in an original prescription to meet the needs of each patient

"In practice however, the physician often finds it advantageous to use a form of combination prepared by skilled pharmacists, preparations having the correct proportion of medication and suitably flavored For all such needs there should be an official preparation either in the U S P or N F and the new revisions of both books are approaching this ideal

*Medicines of Superior and Uniform Quality and Potency*—The letters 'U S P' on a label should mean to physicians, pharmacists and the public a superior quality one adequate for every therapeutic need An honest effort has been made to fix the standards of the Pharmacopœia so that a maximum of efficiency will always be obtained yet without the unnecessary cost due to the exclusion of the last traces of harmless foreign substances

Furthermore a reasonable range must be permitted in U S P standards to allow for the slight differences in analytical results obtained by even well trained chemists and also because some deterioration is likely to occur even under the best storage conditions

*"Scientifically Correct and Usable Titles*—Some official titles have been criticized because of their cumbersome character and it must be admitted that it is difficult to learn and even to pronounce such titles as Erythryl Tetranitrate but this is scientifically correct and has already been adopted by the British Pharmacopœia, and thus adds to the U S P and B P uniformity This has been a mutual policy for ten years

'In practice the Pharmacopœia has provided official abbreviations and often synonyms for use by physicians in prescribing and there are advantages in the use of these which many physicians are recognizing When titles are too short, euphonious and catchy especially when they call for trade marked and packaged medicines the patient usually reads the prescription, buys it at a cut price store and then if it has been efficient recommends it to friends This is not usually in the best interest of the health of the patients or the friends who thereafter are likely to dose themselves with that medicine indefinitely and unwisely Physicians should learn and use official abbreviations when ordering medicines

*"Efficient and Useful Vehicles*—A wide variety of pleasantly flavored vehicles with different solvent properties are provided in the U S P and N F Pharmacists should carry samples of these to physician friends and demonstrate their application The various ointment vehicles and their specific uses should also be explained

*"Research by Outstanding Scientists, Both National and International*—The independent and scientific position of the U S Pharmacopœia has always enabled it to command the cooperation of scientific workers throughout the country

'This feature has been greatly intensified during the past five years and the program now under way offers opportunities and insures results of far reaching importance Happily much of this is assuming international importance through the participation of the pharmacopœial commissions of other nations Studies now under way deal with vitamins and anti anemia products, these two being under the direction of special Pharmacopœial Advisory Boards consisting of internationally known experts

Another study deals with digitals This will be by clinicians and biological experts and will continue for several years The help of the British Pharmacopœial Committee, the Swiss Pharmacopœial Commission and the Canadian experts is assured Other studies dealing with pepsin standards and assay aconite and ergot assays, soaps and antiseptic solutions, ointment vehicles, the extraction of drugs and the preservation of drugs and chemicals are among the researches under way

Undelayed Revision of Standards by Interim, Revision, Whenever Necessitated by Scientific Advance Although authorized by the Pharmacopœial Conventions since 1900, the Committee of Revision rarely took advantage of the opportunity to revise the official standards

between revisions The wisdom and actual necessity for such revisions was faced by the Committee several years ago and promptly accepted as an essential policy for a Pharmacopœia which was to meet the needs of to day with its rapidly developing sciences Four such 'Interim Revisions' were released from 1933 to 1935, providing new standards for Cod Liver Oil Ergot Lactose, Oil of Lemon Magnesia Magma Bichloride Tablets and Non destearinated Cod Liver Oil

'This policy has fully demonstrated its importance and with many new researches now actively in progress under Pharmacopœial supervision with new facts being announced almost daily by the investigators in these related medical sciences, and with valuable new therapeutical agents being developed, the Pharmacopœia must of necessity adopt the plan of interim revision announcements It is hoped that official announcements may be made from time to time as revisions or additions are decided by the Committee but that the printed text may take the form of an 'Annual Supplement to the Pharmacopœia,' appearing on January first of each year

"This plan would largely overcome the difficulty of securing publicity to changes for the users of the Pharmacopœia would soon learn to expect a supplemant yearly and would naturally consult the original Pharmacopœia and all of its supplements to determine the actual standards in force

*"Prompt Recognition of New Medicinal Agents Whenever Their Merit Has Been Proven —* The U S P Convention also authorizes the acceptance of additions to the Pharmacopœia whenever, in the opinion of the Committee, the value of a new remedy justified such recognition

"It is not expected that this permission will be taken advantage of very frequently for a medicinal product is not admitted to the Pharmacopœia until its importance has been widely recognized by the medical profession

"Products such as Insulin, unavailable until 1942 because of patent control, will undoubtedly be admitted as soon as the patent expires

'A serious problem for future Pharmacopœial Committees will be the complications arising from the increasing tendency for universities and manufacturing firms to patent or trade mark new medicinal products

"The policy followed by the Committee up to this time has been the inclusion of meritorious new therapeutic agents of the patented or trade-marked class, only when the consent of the patentee or controlling factor had been obtained When a product was controlled by and its distribution limited to one firm even though consent to include in the U S P had been granted it was believed unwise to admit such substances

'This situation must be restudied and, if possible some way devised whereby essential new medicines may receive Pharmacopœial recognition even though patented, otherwise the basic principle of the Pharmacopœia cannot be maintained namely that 'it shall include the important therapeutic medicines of its day'

"It was never intended that the inclusion of a product in the U S P should in any way alter the legal rights granted an owner under patent or trade mark laws

*"An Organized Program for Extending Reliable Information to the Medical Profession Concerning the Use of Official Medicines*

'(a) *Articles by Eminent Clinicians Suggesting Treatment for Specific Diseases* —Through coöperation with the officials of the American Medical Association, one article of a series of twenty-four, will appear every two weeks for a year in the *Journal of the A M A* These will deal with the use of the official medicines in the treatment of disease and will be written by leading medical men specially qualified for the presentation of each subject The series will be subsequently published in one volume for the information of medical students medical and surgical interns, and for physicians in practice

"Special Articles will be presented on prescription writing and the use of official vehicles and typical prescriptions will be included

"(b) *Suggestions and Helps for Hospital Pharmacists and Pharmacists in General Practice in Extending Information to Physicians Concerning the Use of Official Medicines* —A corresponding series of 24 articles will appear in pharmaceutical journals some weeks prior to the medical articles so that pharmacists and pharmaceutical manufacturers may emphasize to physicians the official products to be discussed and recommended in the forthcoming *A M A Journal* articles Pharmacists could even fill some of the typical prescriptions and show them to physician friends as



an aid to them in prescription writing This will be appreciated especially by some of the younger physicians who often lack confidence in the writing of prescriptions for official medicines where dosage solubility, incompatibilities and vehicles are involved

'(c) *Exhibits for Medical Groups*—It is also planned that an exhibit will be placed in the building of the Philadelphia County Medical Society presenting the preparations and prescriptions recommended in each of the *A M A Journal* articles and these exhibits will be photographed and described for general publication and distribution to pharmacists and hospitals

'It is hoped that pharmacists in many localities will duplicate these exhibits before medical groups

*Pan American Cooperation*—It is gratifying to announce that the Pan American Sanitary Bureau, through its director Dr Hugh S Cumming Surgeon General of the United States Public Health Service and its Assistant Director, Dr Boliver J Lloyd and their staff, have undertaken the translation of the U S P XI into Spanish as an official activity of the Bureau It is hoped that the Spanish Edition will be available by April next when a large Pan American Medical Congress will be held in this country

It is also expected that the medical articles on the use of official medicines, appearing in the *A M A Journal*, will be translated into Spanish and reprinted in the official bulletin of the Bureau for circulation through the twenty one republics affiliated in the Pan-American program

It should be understood, however, that the policy of the U S P Board of Trustees in translating the U S P into Spanish now for four decades has been primarily that it might be available to pharmacists and physicians in Porto Rico, the Philippines and in Cuba In the latter Republic the U S P has been adopted as the official Pharmacopœia for more than thirty years and has been made possible through these years by the coöperation of the pharmacists of Cuba and the help of the scientific staff of the University of Havana and especially Dr Jose Guillermo Diaz

In the present revision Auxiliary Commissions from Cuba Porto Rico and the Philippines have been participating in the revision (see the U S P XI, page viii)

It is expected that each of the other Republics affiliated with the Pan American Union will eventually issue its own Pharmacopœia as is now done by Mexico Brazil the Argentine and others but in offering the U S P in Spanish it has been hoped that increased uniformity in nomenclature, tests and standards will be secured on this content

'*Thanks and Recognition for Those Who Have Made the U S P Eleventh Revision*—The U S P Committee of Revision and Board of Trustees are deeply conscious and gratefully appreciative of the unprecedented loyalty self-sacrificing labor and large financial help contributed by individuals and organizations during the revision of the Pharmacopœia

This help has come not only from American physicians and pharmacists but from many in foreign countries The close cooperation of the British Pharmacopœial Commission has been especially gratifying and points the way to far greater international participation in Pharmacopœial affairs It is hoped that within the decade this may be realized by the establishment at Geneva, under the auspices of the Health Organization of the League of Nations a Secretaryship on Pharmacopœias This is now under serious consideration

A compilation is now being made of the contributions to the revision of the U S P XI that suitable recognition may be given to those who have taken part in the program It is only those who have demonstrated a willingness to contribute of their knowledge and time to the scientific or administrative work of the Pharmacopœia who have earned the right to actively participate in Pharmacopœial affairs, particularly must the Pharmacopœia be lifted from the level of politics

Messrs Hauck Lewitus, Maistelman Seley and others took part in the discussion, which followed Chairman Cook's address

'A rising vote of thanks was extended to the speaker'

HORACE T F GIVENS, *Secretary*

#### NORTHERN OHIO

The December meeting of the Northern Ohio Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held December 13, 1935 at the Faculty Club Western Reserve University, Cleveland, Ohio

This was a dinner meeting and given over to the election of officers for 1936 and the formulation of a bulletin to be mailed to 1400 physicians located in greater Cleveland and Northern Ohio. The *Bulletin* reads as follows

*Bulletin No 1—1936*

Subject —Trade Names

Dear Doctor

In this era of price discussion and complaints we should like to call to your attention a matter upon which cooperative thinking should be helpful to both professions. We refer to medicines with coined names or trade names which the law has classified as proprietary medicines.

A proprietary medicine is not unethical just because it is a proprietary. The American Medical Association has tried to list in New and Nonofficial Remedies those proprietaries it deems useful.

Some U S P and N F preparations and mixtures of them have been given coined names and thus are more expensive than their book equivalents.

Some proprietaries come in pint bottles, some in twelve ounce bottles and many in bottles of odd sizes or, in case of tablets, in odd numerical count. Prescriptions for these come as often for a fraction over the original package as they do for a fraction under the original package. These cases are difficult for the pharmacist to handle with satisfaction to the physician and economy to the patient. Remnants of packages on the shelves of the pharmacy are a total loss.

Frequently, many physicians tell their patients to go to a pharmacy and get a medicine, sometimes a potent drug, or a proprietary. The motive is to save money for the patient. If, in your opinion, this procedure is correct, then write the name of the article, but do not give it verbally to the patient.

We believe this procedure to be very dangerous and the saving involved does not compensate for the danger.

- 1 The patient often makes a mistake in transmitting the name.
- 2 The patient "shops" for price and often goes home from an unscrupulous dealer with a different article.
- 3 The patient is often sold a much larger package than the physician intended for the patient.
- 4 The physician is legally responsible for what the patient gets.
- 5 If the medicine is a proprietary, the physician has openly endorsed it.
- 6 This procedure not only encourages but develops self medication. The patient passes the information on to the neighbors.
- 7 Unscrupulous stores tell people that Dr. X frequently tells his patients to buy this proprietary and therefore it must be good.

In conjunction with a committee of the Academy of Medicine we have prepared the following card which is offered for your consideration.

*Card No 22*

(For use of physician only)

'1 If we receive a prescription for a proprietary upon a *prescription blank, with directions for the patient, and signed by the physician* we are to understand that it is to be transferred from the original container, unless the original container is not of a distinctive color or shape and bears no mark upon it which identifies it. If the prescription is for a specified amount, that amount will be dispensed, and it is understood that the preparation is to be labeled as a prescription in the usual manner with the physician's name and his direction upon it. A charge must be made, in this case, not only for the service, the new container and label but also *because the pharmacist assumes responsibility for the contents*. (Alphonse Tiedge, vs W C Haney et al, 184 Minnesota 569, or 239 Northwestern 611.)

"2 If the prescription is marked 'original container' and directions for the patient are

upon the prescription, it is understood that we merely place a prescription label upon the original container, removing only the printed matter appearing on or coming with the original package. This is to remove the influence of direct advertising to the patient.

'3 If the prescription blank or other paper merely bears the name of the proprietary, and no directions for taking, and does not carry the physician's signature, then it is to be sold as any 'over the counter sale' and at the regular price which is made to any customer asking for the article. This is not a professional transaction and is not so recognized."

"The Northern Ohio Branch of the American Pharmaceutical Association"

#### OFFICERS

The following are the officers elect for the Northern Ohio Branch, A P H A, for 1936  
*President*, Ellsworth Loesch, *Vice President* F W Gehrung, *Secretary* Neil T Chamberlin,  
*Treasurer*, Herbert Decker

*Council Term expiring December 1936*—A L Flandermeyer, W W Hosler, Ellsworth Loesch, Edward Spease *Term expiring December 1937*—Herbert Decker, Z M Gibson, N E Scribner, A E Walleck *Term expiring December 1938*—F J Bacon, N T Chamberlin, A P Gegenheimer, E L McFetridge *Term Expiring December 1939*—E D Davy F W Gehrung, Joseph Jephson H E Speer

#### NORTHWESTERN

A meeting of the Northwestern Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the auditorium of the College of Pharmacy of the University of Minnesota, Minneapolis at 11 30 A M, January 23rd. Students of the College of Pharmacy were guests of the Branch and took part in the program.

Miss Louise Schmitz read an article 'Pharmacy a Profession of Service,' by H W Haggard, M D, which had been originally delivered by Dr Haggard as a radio address and subsequently issued in pamphlet form by the Eastman Kodak Co.

Allan White read an article 'Counter Prescribing' by I Trachtman which was originally published in the *Practical Druggist*.

Ragnar Almin gave an illustrated lecture depicting the evolution of the prescription and projected on the screen many illegible prescriptions taken from the files of present day drug stores.

CHAS V NETZ, *Secretary*,  
 RUGNAR ALMIN, *Chairman*

A meeting of the Northwestern Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the auditorium of the College of Pharmacy, University of Minnesota Minneapolis at 4 30 P M, Thursday, Nov 21st. Gerald Fostvedt reviewed his thesis 'A Study of the Mechanism of the Reaction of Mayer's Reagent with Alkaloids.' In the work incident to the preparation of the thesis he had carefully checked over most of the potassium mercuric iodide alkaloidal reagents and established the fact that the sensitivity of the various reagents was due to the amount of potassium iodide present. Those with a smaller KI excess were the more sensitive. A formula for a potassium mercuric iodide reagent was presented which was some what more sensitive than Valser's reagent and considerably more sensitive than Mayer's reagent.

CHAS V NETZ, *Secretary*,  
 RUGNAR ALMIN, *Chairman*

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**Acute Fluorine Poisoning**—In discussing the recent sodium fluoride poisoning Doctors P J Hanzlik and C D Leake bring out that these poisonings have additional interest in that they contribute to the knowledge of the minimum lethal dose of fluoride which will kill humans.

Dr H E Hasseltine, of the United States Public Health Service—who contracted psittacosis in the work of dismantling the Pasadena laboratory of the California State Board of Health—has recovered from the effects of the disease.

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# JOINT SESSION WITH SECTION ON EDUCATION AND LEGISLATION, CONFERENCE OF PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS AND PHARMACEUTICAL ASSOCIATION SECRETARIES, AMERICAN PHARMACEUTICAL ASSOCIATION

PORTLAND, OREGON, AUGUST 8, 1935

The Joint Session of the above sections met in the Junior Ball Room of the Multnomah Hotel, Portland, Oregon at 8 00 P M, August 8, 1935 President F V McCullough, of the Conference of Pharmaceutical Association Secretaries, opened the meeting M N Ford acted as secretary Mr McCullough turned the chairmanship over to Dr R L Swain, chairman of the Conference of Pharmaceutical Association Enforcement Officials, who presided during the remainder of the session

Chairman Swain called for reports on enacted and proposed legislation in force in the different states

Mr Clayton, of Colorado stated that there were two pieces of legislation enacted in Colorado which were of importance to retail druggists—one restricting the sale of hypnotic drugs to prescription only and the other a law prohibiting the sale of prepared foods in any place used for other purposes The Chairman asked if the latter mentioned law was a spite measure

Mr Baker, of Colorado replied Not particularly, that it was a movement going on all over the United States He said that the hypnotic law passed in Colorado was the same as passed in other states which was discussed during the morning session, that the law was only five months old and that they had good coöperation from druggists, hospitals and doctors, that the greatest difficulties encountered had been with hospitals He stated they were endeavoring to have every hospital in the State which could support a dispensary employ a registered pharmacist, that they had been very fortunate so far, in licensing about 20 hospitals under the supervision of registered pharmacists, there were many hospitals not large enough to support a dispensary They made a distinction with closed hospitals and hospitals which are under the care and direction of physicians—private hospitals In such cases they required that they have prescriptions filled outside of the hospital by retail drug stores Mr Baker stated that Mr Bishop from his state (Colorado) could tell more about the food legislation than he could

Mr Bishop explained that the food law was, in his mind a very vicious law, sponsored by the restaurant people, in fact, supported by the National Restaurant Association and that there had been about \$15 000 00 expended in an effort to put it over The druggists made no objection to regulatory measures concerning sanitation, etc, but that the law did not contain such regulations The law provided that all food, even a sandwich or piece of pie, had to be kept in a separate room from the other part of the building

Mr Bishop stated that a fund of \$5000 00 had been raised to fight the bill It was taken to the Federal court and the Federal judges granted an injunction restraining the law from becoming operative until it could be tried in the District court If tried in the District court and declared a law that they would still take it to the Federal court

Mr Bishop stated that the hypnotic law was a doctor's measure—that before they knew much about it the bill was passed and handed over to the Board of Pharmacy to administer

Roy Cook, of West Virginia, spoke concerning similar legislation which had been proposed in West Virginia, this, he stated, included not only food sales but soda fountain sales as well This covered a larger territory, as hundreds of drug stores had soda fountains One of the measures was to the effect that food and soda fountain service must be kept separate from the drug department The aperture between the two departments to be not more than 3 feet wide and over 7 feet high After considerable effort on the part of the pharmacists the bill was defeated but similar legislation seemed to come up regularly at each session of the legislature He referred to an ice cream bill—the standard ice cream bill introduced in several eastern states It contained a clause to the effect that all milk products should be pasteurized at the place where they were sold, but that so far they had been able to defeat it

Dr Swain stated that at the last meeting of the National Association of Boards of Pharmacy

arrangements had been made to institute a fact-finding department to which all the states would supply information

The Chairman announced that inasmuch as this was an informal program discussion was in order on legislation on the statute books, proposed legislation or experiences in prosecution of legislative programs. He then stated that he had a copy of a proposed measure for enactment, being Senate Bill 3084 introduced in the U S Senate May 13 entitled "A bill to regulate the practice of pharmacy in the District of Columbia." That it was one of the most unique attempts at pharmaceutical legislation with which he had come in contact.

Dr Swain cursorily outlined sections of the proposed bill—its attempt to deal with definitions as concerns primary preparations and the ordinary patent medicine type the question of the dispensing doctor—that in order for him to qualify as a medical dispenser he must have a permit and pass an examination before the board, the setting up of an office of superintendent of drugs and specifying his duties in that office. Section 9 dealing with establishment of standards hours of inspection, etc., the bill's attempt to deal with substitution, providing for fines, etc, and the provision in event of a second substitution of forfeiture of a pharmacist's right to practice pharmacy, prohibition of peddling drugs and medicines provision for standards of equipment etc. He stated that it is a most interesting piece of legislation for the pharmacists and that attempts might be made to duplicate a good many of its features in other states.

L L Walton understood that the bill provided for establishment of an office to be known as superintendent of drugs and inquired if it specified the duties of that officer.

Dr Swain replied that it did, outlining such duties etc. it also provided means for his removal, etc.

C B Jordan inquired if there was anything in the bill to control prescribing of drugs by pharmacists. The Chairman stated that he had made no critical analysis of the bill and did not know all of the points it covered but that he thought the bill novel and that it would justify reading and study.

Mr Cook inquired as to what was meant by the term medical dispenser in the bill.

Dr Swain reading from the bill stated the term medical dispenser meant a person licensed to practice medicine in the District of Columbia and licensed by the board of pharmacy to dispense for the treatment of his *bona fide* patients but did not mean dispensing by the drugless method of healing etc.

H E Kendig stated that he did not believe it would be possible for such legislation to be enforced—that there were times for the quick alleviation of pain when a physician would give a patient a tablet and that, under the proposed measure would constitute a violation of the law.

H C Christensen called attention to institutions prevalent throughout the Northwest known as Hospital Associations where they (the associations) contracted to give a medical service and the physicians employed by such associations had stocks of drugs which they used in their practice.

L L Walton, of Pennsylvania inquired relative to the authority provided in the bill under discussion for determination of what action should be taken in case of reported violation, whether it remained with the board of pharmacy or not.

Dr Swain thought it did—that enforcement had been placed with the board of pharmacy and was to be made effective through the Superintendent of Drugs, in conjunction with the police department of the District.

Roy B Cook inquired if it was to be financed with federal funds. The Chairman thought it would be.

Dr Hugo Schaefer, of New York stated that two years ago they were successful in passing a bill in New York the so called Dunkel bill which on the face of it simply put under the control of the board of pharmacy the sale of those preparations which contained poisonous deleterious or harmful ingredients that they had it first contained, later they passed the law without the word 'contained' which weakened the law but it was placed under the control of the board of pharmacy. The board however set up regulations necessary to carry out the duties under the law. It was at first ruled that such preparations should only be sold in registered pharmacies by registered pharmacists. Dr Schaefer pointed out the importance of proving to a court when the measure came up as a test case that the pharmacists were adding a measure of safety by the regulation.

He stated that further regulations were still needed. The board ruled that since the law said "preparations which were poisonous, etc." they would be considered poisonous if the total contents of the package were poisonous. A definition was in the old law—that any preparation which in 60 grain doses or less might cause death in human adult life. It was held that if the total contents of the package were dangerous to human adult life, then that preparation could only be sold by a registered pharmacist.

Dr Schaefer explained that they passed a labeling law which read "Any preparation which contains a poison, the name must be shown on the label," which meant that if a preparation had strychnine in it that must be noted on the package. While it was to some extent, a formula disclosure law, it simply meant that names of potent ingredients must be stated on the label. At the same time, they passed a law that the manufacturer's name and address must be printed on the package and that the preparation must be made under the supervision of a pharmacist or chemist. In so doing, they had gotten away altogether from the problem of trying to distinguish between patent medicines and what are called proprietaries—that they did not have to make any distinction, although it practically meant that all of the ethical preparations are limited in sales by the drug store and the number of patent medicines allowed to be sold outside the drug stores is very small. They had had cases in court under the law with collections of fines and so far had been very successful in its application.

The Chairman asked if they had met with much opposition to the bill and Dr Schaefer replied that there was a hearing of course, but that the secretary of the board of pharmacy was very successful in working it out. They had had more trouble with the Dunkel Law.

Fred Schaefer asked if when the word "contained" was omitted they allowed it to go over. Dr Schaefer replied that they had.

The Chairman brought up the question as to enforcement on goods from other states and Dr Schaefer explained that on all preparations sold in New York, as far as labeling was concerned, they enforced it, so far as the provisions of the Dunkel bill itself were concerned. In other words, if the preparation was manufactured outside the state they would still require that its contents must be stated on the label. They could not enforce rules outside the state for the manufacture by chemists, etc.

Dr L L Walton inquired whether or not the New York pharmacists had considered the question of any liability, or rather increased liability, resting upon the pharmacist who sold one of these packages with resultant injury therefrom to the customer.

Dr Schaefer replied that the existing law increased the liability of the pharmacist—that the bill says that he must use reasonable precautions. There was no use in trying to pass the bill—requiring that they should be sold directly by the pharmacist without taking on added responsibility, but that they felt that the possibility of such liability as was mentioned was the lesser of the two evils. Dr Walton then stated that he could see where they would have to assign some such reason in maintaining the law—that the pharmacist should be willing to take some responsibility, in exchange for being given preference in selling.

Dr A G DuMez asked if Dr Schaefer had noticed any tendency on the part of the manufacturers to reduce the size of their packages—that they might reduce to a ten cent size in case a larger size would make the package a poison.

Dr Schaefer stated that had been considered but that the law had not been in force long enough to show whether or not there would be such a tendency—that they were talking about the restriction of sales of preparations to the pharmacists for the purpose of helping the pharmacists but, on the other hand, it was for the betterment of health generally—that sometimes children will get hold of a package of pills and take the entire package—that in such a restriction as they had embodied in this law they felt they had gone a long way toward protecting the public health.

A L I Winne, of Virginia, said that in several states where the attempt had been made to restrict the sale of patent and proprietary medicines to pharmacists, that the laws making such restrictions fell down, because the pharmacists were charged with no additional duty other than the grocer was charged with—that those who drafted the laws did not take the precaution to make a distinction between the pharmacist and anyone else. He believed they would have to put it as a special duty devolving upon the pharmacist, that duty being—when such a sale is made that the pharmacist must call to the attention of the purchaser that the ingredient contains poison.

C B Jordan inquired if there was any objection of retail pharmacists to the bill. Dr Schaefer replied that there was not.

B V McCullough asked if there were any one man drug stores in New York. Dr Schaefer stated that there were and that he was curious to know what thought prompted the question. Mr McCullough said that usually in such stores—there was an unregistered assistant—a son daughter or wife and that he was thinking of the law in that connection.

The Chairman stated that he did not see the basis of any damage suit under such a law more than ordinarily obtained. Dr Schaefer stated that the law, as he had observed its operation was a fine thing.

Roy B Cook inquired if in a drug store in some other state not having such a law there could be any damage brought against them for not giving notification of poison content at the time of making the sale.

Chairman Swain replied that the case of *Emanuel vs West*, he thought, answered that. In that case some one purchased a bottle of headache medicine which resulted in a damage suit. There was no statement on the label indicating anything of a poisonous nature. The court laid down the rule that it was a sale of an article of merchandise and that the party making the sale, having no information no liability could attach to him for selling it, but that he (Dr Swain) surmised that there might be a real question if the label would have told what it contained.

Dr Schaefer stated that if the pharmacist in New York used reasonable precaution in pointing out the contents of the package, no liability could attach to him, but if he did not use precaution in so pointing out then the measure of liability of that man is far greater, because the law distinctly places the duty upon him. He stated that there had been some cases—not of medicinal preparations but of cosmetics—where the decisions made two distinctions that were very interesting. A certain kind of skin bleach had been sold in a department store of unknown proportion and content, that had created some kind of a skin rash, the bleach had been asked for by the customer and sold by the store and the court held that the manufacturer was the one liable. In a similar case where the product was sold by a demonstrator of the store the retail store and manufacturer were jointly liable.

Roy B Cook stated that it would seem off hand, that the seller in New York would have a shield surrounding his sale that would not apply elsewhere.

Chairman Swain stated that he believed that unquestionably the principle underlying the Dunkel bill was sound not only in so far as it referred to the retail store but in general, and whether it burdened the retailer or not should not be taken into consideration—that he thought it a fine thing so far as the principle itself was concerned, he thought they owed it to the public and to themselves citing an old rule laid down that 'while druggists are called merchandisers we must remember that they are something more' and that he thought a revision of their terminology quite in line.

F H King, of Ohio said he felt that pharmacists as a general rule, made the practice of putting the public on guard that in his store when a customer asked for Hinkle pills he and his pharmacists would invariably ask 'Do you mean the tablet containing strychnine or do you want the tablet without strychnine?' That he had confidence in pharmacists that in selling a tablet containing strychnine they would warn the customer.

B V McCullough brought up the subject of state medicine, that is fresh biologicals, anti toxins, rabies treatment, etc, being furnished free by the state board of health.

Mr Cook thought if the matter were examined they would find a good many states had that provision now. Mr McCullough informed they did not have it in Indiana and did not want it. Mr Cook stated it was quite general in his state for medicine supplied to be distributed for charity purposes, but that often they found their way into channels far removed from any charitable need. Mr King brought out that opposition would put the pharmacist in the danger of being considered inhuman. Mr McCullough said that Indiana was very liberal in handling the situation that one desiring rabies or diphtheria treatment could go to the druggist and get it, and that in turn the druggist charged it to the county at retail prices.

Dr Schaefer, of New York, stated they had some difficulty with the situation of free medicines. However he believed that it would put the pharmacist in an awkward position to oppose it—that he thought the solution was to try to get regulations through which would properly regulate its disposal and eliminate the giving away of medicines to people not actually in need of it. The situation was comparable to the free clinics which the doctors had to contend with, that a few years ago almost anybody could go to a free clinic and get treatment, but that now they were

requiring a strict personal history of each case and it had to be shown that the person was not able to pay for such service

This concluded the discussions and the Chairman stated that if there was no further business to come before the meeting, a motion for adjournment was in order. The motion was duly made, seconded and carried, and the meeting adjourned.

R L SWAIN, *Chairman*,  
M N FORD, *Secretary*

## THE CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES

ABSTRACT OF THE MINUTES OF THE SESSIONS HELD IN PORTLAND, ORE., WEDNESDAY, AUGUST 7TH, 2 00 P M., FRIDAY, AUGUST 9TH, 9 30 A M., JOINT SESSION WITH SECTION ON EDUCATION AND LEGISLATION AND PHARMACEUTICAL LAW ENFORCEMENT OFFICIALS, THURSDAY, AUGUST 8TH AT 8 00 P M.

The First Session of the Conference of Pharmaceutical Association Secretaries was called to order August 7th, at 2 00 P M., by President F V McCullough.

The following responded to roll call: Roy S Warnack, California, C J Clayton, Colorado, R C Wilson, Georgia, Elmer B Williams, Idaho, W B Day, Illinois, F V McCullough, Indiana, E F Kelly, Maryland, J G Beard, North Carolina, Robert P Fischelis, New Jersey, L C Duncan, Oklahoma, Jack Lynch, Oregon, Walter D Adams, Texas, A L I Winne, Virginia, J L Hayman, West Virginia, Jennings Murphy, Wisconsin.

On motion of R C Wilson, duly seconded, the members stood in silence out of respect to Secretaries W E Bingham, Alabama, Edward S Dawson, New York, P H Garvin, Connecticut, and Roy C Reese, Kansas, deceased.

Owing to the absence of Secretary Carl G A Harring, J Lester Hayman acted as Secretary. President F V McCullough presented the following report which, on motion, duly seconded, was accepted.

## REMARKS OF THE PRESIDENT OF THE CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES

BY F V MCCULLOUGH

### *Fellow Secretaries and Friends of Organized Pharmacy*

I am very happy to have the privilege of greeting you at the opening of this, the Eighth Annual Meeting of The Conference of Pharmaceutical Association Secretaries, and to have the honor of presiding over its deliberations.

In behalf of the Conference I extend a very cordial invitation to all Pharmaceutical Secretaries and other officers to attend the sessions. This applies to the officers of metropolitan groups as well as state associations. Whether your organization has been represented by membership in the Conference or not, you are welcome and invited to participate in our deliberations.

While our printed program may not appear to be impressive, I am sure you will find the subjects of much interest and of value in your association work, as I have a very high regard for the leadership and council of those who have attended and participated in the programs of previous meetings.

The Conference was organized at the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION in St. Louis in 1927. Each year since it has held a meeting such as this, where matters of particular interest to pharmaceutical association secretaries were discussed and secretaries were given an opportunity to exchange viewpoints on their many problems.

Throughout these eight years, bulletins have been exchanged which have given our members the advantage of experiences of other secretaries in conducting membership campaigns, holding conventions, conducting legislation, etc.

The AMERICAN PHARMACEUTICAL ASSOCIATION has a valued record of service to American pharmacy. Its annual conventions have been a means of bringing together men who are devoting their lives to the various phases of pharmaceutical practice, where they can discuss with each other their problems, theories, experiences and results of their endeavors and in that way be of assistance.



tance to each other It is one way progress in our profession and the drug industry has been made, particularly so in the scientific and professional

These conventions have also been the birthplace of other national organizations Our organization was mothered by it as also were the National Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy Our Association is unlike them in that the principal functions they each have to perform are wholly within their groups, while the principal objects of the Conference of Secretaries, as set out in the Constitution and By Laws, concerns the improvement of the service to the membership of all organized pharmacy

An opinion prevailed among the secretaries in attendance at the last meeting of the Conference, which was held in May 1934, in the city of Washington, that state associations have failed to give the officers of our national associations the support and cooperation that they were capable of giving during the period of preparing a code for the drug trade and that state associations have failed to receive the recognition by code authorities to which they were entitled It was necessary for the national leaders to stand alone in their fight for the drug trade while forty eight strong associations representing probably more than 30,000 retail druggists desiring to be of assistance stood by The reason for this condition was believed to be the lack of a close working affiliation of state associations with each other with one directing head and the lack of a closer affiliation with our national associations

Following a discussion of these conditions a resolution was offered and approved stating that in the opinion of the Conference a federation of state associations should be formed at an early date, that the matter of such an organization should be presented to the Council of the A P H A and the Executive Committee of the N A R D It was an impromptu resolution and to those who did not know the spirit in which it was presented, discussed and acted upon, it was susceptible of being misconstrued, and following the convention it was erroneously reported in some sections that the Conference of Pharmaceutical Association Secretaries was favoring and sponsoring a new national association to be known as "A Federation of State Associations"

The resolution did not suggest or imply a new association, because the resolution itself placed the matter before our national associations to whom it was referred The theme of the discussion was that coordination of effort was more to be desired than duplication of effort, that if state associations were federated and closer affiliated with our national associations, organized efforts would be better coordinated

There was nothing in the resolution outlining the mechanics of a federation or a better affiliation with the national groups The only thought as intended by the Conference was that a federation of existing state associations was essential if the industry was to receive the full benefit of pharmaceutical organization Personally I believe and have continually contended that the mechanics of such an organization should come in the way of proposals from the national associations to the state associations, that this conference should not attempt to dictate to either the national associations or to state associations but to be of assistance to both in advisory capacity As the matter was referred to the executive officers of both associations it has received their consideration since that time and some progress has been made as will be reported at our second business session

The matter of a closer interweaving of our Pharmaceutical Associations is a responsibility facing our organization leaders this year and it should be faced courageously and unselfishly There is a united opinion supported by much evidence that a better coordination of pharmaceutical association activity is very essential There may be and it is quite natural there would be a division of opinion of the best plans to bring it about Our conference is not advocating any plans It is looking to our national associations for them The work they are doing in their respective fields of endeavor should not and must not be sacrificed in this new order Each is needed and it is hoped will be strengthened by the closer tie up

Our conference is not without a share of the responsibility in this matter We are closer to our membership than the officers of our national associations It is our responsibility to secure membership support to any plan offered by our national associations and I recommend that the conference go on record pledging its cooperation in securing membership and state association acceptance to any plans proposed by our national associations that will lead to a closer coordination of organization effort I personally believe that if a combined membership in our national and state associations can be made available at a reasonable fee many will take advantage of it and

it will be a connecting link that will add much strength to associations representing Pharmacy

As a representative of the Conference an invitation was extended me to address the convention of the National Association of Retail Druggists during their annual convention at New Orleans last September. At that time I endeavored to clarify the erroneous report connecting our Conference with a proposed new national association. With the approval of the executive officers some suggestions were made for the purpose of placing something constructive before the convention. Among them was a request for a bulletin service by the N A R D to affiliated state associations, believing that such a service would fill a long felt need.

During the convention a meeting of secretaries was called and a resolution was prepared and presented to the resolutions committee of the convention requesting this bulletin service. Secretary Darg vel called a meeting of the presidents and secretaries of state and metropolitan associations at which time Harvey Henry, chairman of the executive committee of the N A R D, now president, announced that the bulletin service would be inaugurated.

A Washington bulletin is now being sent by the Washington representative of the N A R D to the officers of state and metropolitan associations and it is being found of great value and the character of the bulletin is reflecting credit to the N A R D and its Washington office.

May I again refer to the program of this Conference. Rowland Jones, Washington N A R D representative and author of the bulletins, is to address our Conference at this session. Following his address we should have an open forum discussion of ways to gain the most from this bulletin service. At the Second Session R C Wilson of Georgia will make a report on the conference he attended with the representatives of the A P H A and the N A R D which met in Washington for the purpose of considering ways and means of forming a federation of state associations under our national organizations.

At the same time we will have an analysis of a questionnaire sent out from my office to the secretaries concerning the report on this conference. This will be a very important session and it is hoped that a large number of states will be represented.

At our Third Session secretaries of wide experience and who have successful records of accomplishment will address the Conference on three important fields of service. Much valuable information will be gained at this session and no secretary should permit anything to interfere with his attendance. Those who have had experience in fair trade legislation will give us the benefit of their experience.

The fields of service for trade associations or professional societies vary but little with us, especially those of us who are secretaries of state associations find three distinctive fields of service—*first*, promoting the professional, technical or scientific phase of the practice of pharmacy, *second* the legal and legislative and *third*, the economic business and trade practices. In these fields of service state associations have very much in common with each other and also in common with the national association to which they owe allegiance and to the metropolitan associations that are within their respective groups.

Those who became identified with pharmaceutical associations in the earlier days found the principal field to be "the promoting of the professional or technical phase." Soon and very rapidly there developed the necessity of legal and legislative service and in recent years there has developed a broad and important field of service in the economic and trade practice field. In many of our states, and especially so in mine, the promoting of the professional or technical phase of the practice of pharmacy is being left largely to our Pharmacy Board and to our Colleges of Pharmacy to whom druggists look for such leadership rather than to the Association.

Many members are inclined to measure erroneously the success and the value of an association by its activity and results in the legislation, overlooking the great service associations are rendering to the industry in the economic or trade practice field. The time has now come when regulatory legislation is going beyond matters of public health and public morals and is including business and trade practices. Evidence of this is in the number of states that have recently enacted fair trade laws. This makes a very close tie-up of the economic and legislative fields of service and also makes it very essential for all states to harmonize their endeavors along this line.

In concluding may I leave these thoughts. The progress and success of a trade association does not depend entirely upon the number of its members or the treasurer's balance. Any association that has within its membership 50% of those engaged in the industry that it represents, and among them a good per cent of the leaders, should undertake definite objectives and meet with so

much success that membership support will be attracted. Such an association is in a healthy condition, although it may be thought to be weak in membership.

The achievements of an association should not be measured by the treasurer's balance or the membership roll or the ballyhoo of its officers or the wail of those dissatisfied. The character of its objectives, the scope of its service, the manner in which it cooperates with other associations, help to make a yardstick by which accomplishments of association endeavors are measured, and accomplishments of associations' efforts are often not recognized, although they may be ever so valuable.

The progress and accomplishments in our endeavors are not to be credited to one association or to one or any group of individuals. It is the result of combined organization effort within the industry and the unselfish service of many faithful leaders and their loyal supporters within the ranks. So may each of us continue to do his part in this scene of organized activities, and our associations do their part. May the inspiration of this convention together with the progress made in our own respective associations, be the starting place for another year's unselfish service in our chosen fields of endeavor, and may the industry continue to be well served by organized pharmacy, and may we as association officers be worthy of the support we are receiving from those within the ranks of our membership who are depending upon us for unselfish council and leadership.

The report of Carl G. A. Harring was read and accepted, it follows:

### REPORT OF THE SECRETARY

#### *Fellow Secretaries*

In rendering this annual report your secretary greatly regrets his inability to render it in person and of having the privilege to once more meet the admirable body of men who, in face of difficulties of various nature and occasional criticisms—many of them unjust and uncalled for, carry on from day to day their labors for the advancement of organized pharmacy—oftentimes without hope of fee or reward. I likewise regret that this report may seem meagre in point of recording achievements in the secretarial world during the past year but with the increasing system of exchange of pharmaceutical journals and association bulletins, as well as the establishment of official as well as several non official Washington bulletins secretaries are being kept well informed about what is going on and have facilities for keeping the membership of their association equally well informed.

The highlights of the past year from a secretarial standpoint were the conferences in New Orleans with the N. A. R. D. executives which resulted in the bulletin service now rendered by the National Association of Retail Druggists, and the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, the N. A. R. D. and the Secretarial Conference officers held in Washington for the purpose of discussing closer affiliations between these bodies. As your secretary was unable to attend this Conference, he will leave the report of the same to some one who attended the meeting, and the conclusions to be drawn from the proceedings to the report of these gentlemen and our president.

It is a regrettable fact that the Secretaries Conference is not a one hundred per cent organization. If allowance is made for some real secretaries that we are fortunate to hail as members of our Conference, we are less than a fifty per cent organization. Possibly the five dollar membership fee acts as a deterrent on the other fifty per cent—or maybe we have not shown good salesmanship in offering this opportunity for closer cooperation to all our brother secretaries.

Your secretary would again suggest that a fee of two dollars would be sufficient for the purpose of defraying expenses, and would perhaps make the membership proposition more attractive.

With the sincere hope that it may be my privilege to be present at the next meeting of our Conference, I respectfully submit this report.

(Signed) CARL G. A. HARRING, *Secretary*

Robert C. Wilson stated that he was asked to attend a joint conference of the secretaries and representatives of the National Association of Retail Druggists and AMERICAN PHARMACEUTICAL ASSOCIATION. Secretary McCullough and Secretary Harring were the other members of the committee, unfortunately they could not attend the conference in Washington. Secretary Hayman was invited to be present, Rowland Jones, John W. Dargavel and Thomas S. Smith were

also present, and E F Kelly and R L Swain represented the AMERICAN PHARMACEUTICAL ASSOCIATION

Secretary Wilson stated that some closer working plan was necessary between state associations and the two national associations that there should be a common objective and some effort should be made to work out plans by which the aims could be directed and the objectives reached. He stated that an attempt should be made to acquire confidence in leadership. The means should be provided whereby this could be maintained. He suggested to the conference the possibility of a bulletin half of which would be under the auspices of the N A R D and the other half under that of the A P H A. This publication should be sent out once a month and each state should contribute a small sum for each member, say 50 cents. He also suggested that a plan should be worked out whereby all members of state associations would become affiliated members of the N A R D and the A P H A. The matter was discussed and it was decided that there be no consolidation, but it was generally understood that a suggestion would be submitted to the Council of the A P H A and to the Executive Committee of the N A R D. He thought that the discussions resulted in the recommendation along these lines by President Fischelis. He felt that something had been started which might be developed.

Secretary Beard thought it was unnecessary to have two national organizations. This idea obtained in his state. In his opinion, if the two organizations consolidated they would command the respect of every pharmacist, and when such an organization would work in harmony things would be accomplished. As far as the publication is concerned the name made no particular difference.

President F V McCullough stated that there was a motion before the Conference amending Article B of the By-Laws and reducing the annual dues from \$5 00 to \$3 00 a year. The motion to amend the By Laws was carried and reads as follows:

"Membership dues in the Conference shall be \$3 00 for active and \$3 00 for associate membership for the calendar year, or such other amount as may be fixed at the annual convention of the Conference."

## CONSTITUTION AND BY-LAWS OF THE CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES

### CONSTITUTION

*Preamble*—WHEREAS, for mutual benefit and advancement there is a national organization of every branch of pharmacy and the drug trade of America excepting one composed of secretaries of pharmaceutical organizations, and

WHEREAS, secretaries of pharmaceutical associations, by reason of their close contact with the individual membership of the pharmaceutical profession, are in a position to do the greatest good to the largest number of members of the profession in the dissemination of pharmaceutical knowledge and information, and

WHEREAS, it is necessary and desirable that pharmaceutical secretaries shall encourage and promote the welfare of and fraternity among the members of the various pharmaceutical organizations, by transmitting to their members for mutual benefit such professional, executive, convention, organization and legislative information, obtained by reciprocity and exchange of ideas, as will help to maintain within each association the high ethical and efficient standards generally observed by other pharmaceutical organizations

Therefore, to provide for the accomplishment of the above-enumerated objects, WE, the secretaries of pharmaceutical associations, do form ourselves as individuals into an association and agree to be governed by the following Constitution and By-Laws

ARTICLE I—*Name*—The name of this organization shall be Conference of Pharmaceutical Association Secretaries

ARTICLE II—*Membership*—Membership in this organization shall be of two classes, active and associate. Active membership shall be confined to State Pharmaceutical Secretaries and full-time secretaries of local retail pharmaceutical associations, associate membership to persons who have served as secretaries as defined under active membership for a period of not less than three years

ARTICLE III—*Objects*—To provide for interchange of executive information between

pharmaceutical organizations and to improve the service to members of pharmaceutical associations

ARTICLE IV—*Officers and Election*—The officers of this association shall be a President a First Vice-President a Second Vice President, a Secretary-Treasurer and an Executive Committee consisting of the President, the two Vice-Presidents the Secretary and five elected members. Officers shall be elected at the annual convention and serve for a period of one year or until their successors have been elected.

ARTICLE V—*Meetings*—The Conference shall meet annually at the time and place of the AMERICAN PHARMACEUTICAL ASSOCIATION'S annual convention or at such other times and places as the Conference or the Executive Committee deems advisable.

ARTICLE VI—*Constitutional Amendments*—Amendments to this constitution may be submitted in writing at any session of the annual meeting and be acted upon at any succeeding session.

#### BY-LAWS

ARTICLE A—*Duties of Officers*—(a) The *President* shall preside at all meetings of the Conference and the Executive Committee appoint all committees not otherwise provided for, call special meetings of the Executive Committee when deemed advisable for the good of the Conference.

(b) The *First or Second Vice President* in the absence of the President shall fulfil the duties of the President.

(c) The *Secretary* shall be responsible to and under the direct control and supervision of the Conference and Executive Committee and his duties shall be as follows:

1 He shall keep a record of all meetings and conduct and preserve all correspondence of the Conference.

2 He shall act as Secretary of the Executive Committee, and, if necessary, of all other committees of the organization, keeping a record of the work of each committee, issue calls to its meetings and keeping its committeemen informed of pertinent matters; issue bulletins under the direction of the committee to the membership of the Conference, relative to matters under the committee's jurisdiction, collect and compile data to further the committee's work, supply its committeemen with stationery and forms and render such other assistance as each committee may require.

3 He shall keep the members of the Conference informed, through bulletins issued to the membership of all business transacted by the various committees and at the annual convention of the Conference.

4 He shall perform such other duties as the Conference or the Executive Committee may designate from time to time.

5 While acting as the Treasurer he shall receive all funds and disburse the same under the direction of the Executive Committee or by vote of the Conference and report in detail at each annual meeting.

6 He shall make a report of his year's work at each annual convention of the Conference.

(d) The *Executive Committee* shall provide for the property and equipment necessary to the proper functioning of the organization, shall regulate and control and dispose of any property belonging to the Conference and transact all other business of the Conference between annual meetings and fill all vacancies that may occur in elective offices between annual meetings and perform such other duties and exercise such other powers as may be delegated to or conferred upon it by the Conference or the Constitution and By Laws. It shall fix the compensation of the Secretary.

ARTICLE B—*Dues*—Membership dues in the Conference shall be \$5 00 for active and \$3 00 for associate membership per calendar year, or such other amount as may be fixed at the annual convention of the Conference.

ARTICLE C—*Committees*—Standing Committees Unless otherwise provided for, the President shall appoint from the membership the following standing committees of three members each:

- 1 Committee on Nominations
- 2 Committee on Legislation

- 3 Committee on Publication and Publicity
- 4 Committee on Programs of Meetings
- 5 Committee on Speakers

*Special Committees*—The President shall appoint from the membership such special committees as may be authorized by the Conference or by the Executive Committee. Such special committees shall lapse at the next annual meeting unless otherwise provided.

ARTICLE D—*Activities*—The activities of the Conference shall be

- 1 To provide for the interchange of association publications
- 2 The interchange of state pharmacy laws and important city ordinances affecting pharmacy
- 3 Interchange of annual convention information, such as arrangements, programs, financing, donations, contributions, legislative activities
- 4 Round table discussions on Association Management
- 5 Such other activities as may be recommended by the Conference in annual convention

ARTICLE E—*Order of Business*—The order of business for the annual convention of the Conference shall be as follows

- 1 Call to order
- 2 Calling the roll
- 3 Reading the minutes
- 4 The President's Address
- 5 Appointment of committees
- 6 Reports of officers
- 7 Reading communications
- 8 Report of Committee on Membership
- 9 Election of members
- 10 Election of officers
- 11 Miscellaneous business
- 12 Reading of papers, addresses and discussions
- 13 Unfinished business
- 14 Installation of officers
- 15 Adjournment

ARTICLE F—*Rules of Order*—The ordinary rules of parliamentary bodies shall govern the Conference and shall be enforced by the presiding officer.

ARTICLE G—*Amendments*—Amendments to the By-Laws may be submitted in writing at any annual meeting and be acted upon at any subsequent session.

Rowland Jones stated that the Bulletin Service was started as a direct result of the request made by the group referred to. He stated that probably some mistakes had been made, but the effort was in the direction of presenting something valuable for each individual. One of the main objects of the *Bulletin* was to bring information to the Secretaries which could be passed on to the membership of the Associations. There has been criticism but also commendations. The idea in presenting matters was to present the subject as clearly as possible so that the information would be understood. In one of the bulletins the alcohol proposition was discussed and a few days after the *Bulletin* was mailed out he was privileged to speak at a district meeting of the Maryland Pharmaceutical Association, and one of the druggists accused the N A R D of defending boot legging. In a bulletin subsequent to that he endeavored to explain this misunderstanding. Many thought the *Bulletin* of sufficient importance to be sent out to all of the members. Information on these matters reached the Government. Mr. Jones stated that he had no new information but he would like to hear discussion as to how the *Bulletin* might be made of greater service, that it could be enlarged to about twice the size for the same postage. He solicited criticism and suggestions.

A short time ago pamphlets were mailed out on the Patman investigation of the American Retail Federation. This investigation has brought to light a great many things that have attracted attention. Among other things the investigation showed that the chain stores did 50 per

cent of the food business and that their success was dependent on the discount which they are able to obtain through their buying power

Mr Jones recommended that the report be read by the members, because the information given is sworn testimony and gives information on many different things that are going on in the business world Among these are the methods of fighting state legislation He was amazed at the careful way in which this was worked Before leaving Washington he had spoken to Congressman Patman and the latter informed him that the bill would probably be reported on by the Committee to whom it was referred by a vote of fifteen to three The Committee on Judiciary had held several sessions in discussing the Patman Bill

It was asked what this bill would accomplish for the retail pharmacist and Mr Jones replied that it will make illegal any discount which cannot be demonstrated as being an earned discount The seller cannot give a discount to any buyer which he does not give to all buyers on quantity basis, unless it can be proven that the large volume purchased results in economy for him

It was stated of a company that no discount on a quantity in excess of one gross was justified on the basis of economy and represents no savings to the manufacturer more than that which is not earned on a quantity basis The motion was made and duly seconded commending the N A R D for the *Bulletin Service* to State secretaries

The First Session was then adjourned

## SECOND SESSION

The Second Session of the Conference of Pharmaceutical Association Secretaries was convened by President F V McCullough at 9 30 A M, August 9 1935

The report of the Committee on Nominations was called for, it was presented by Charles J Clayton, as follows *President*, J W Slocum, Iowa, *First Vice-President*, Roy S Warnack California, *Second Vice President*, William B Day, Illinois, *Secretary Treasurer*, Carl G A Haring Massachusetts, *Executive Committee* the foregoing officers and F V McCullough, Indiana, A L I Winne Virginia, Robert C Wilson Georgia, J J Gill, Rhode Island, J Lester Hayman, West Virginia, Jennings Murphy, Wisconsin, *Delegate to the House of Delegates*, Charles J Clayton, Colorado

On motion in due course the officers and committee members were elected

Charles J Clayton, speaking for J W Slocum, who was absent, on 'The Secretary's Obligation to the Industry and Profession in Sponsoring State and National Legislation'

Speaking for himself—'he acted in an advisory capacity and collected information and disseminated news He did not make any attempt to dictate the policies of the legislative committee, the members acted according to their own views on the suggestions He did not think the secretary should act as an aid and as a director of activities'

R. C Wilson suggested, owing to the small attendance that instead of carrying out the program a further discussion of the bulletin be taken up He said, 'some progress is being made In conversation with President McCullough and the Secretary, the latter gave figures on the cost of 30 000 copies and that this could be sent to all members of an association for about 25 cents per year He cited Georgia with 500 members would pay \$225 00 The suggestion included further that there would be no duplication, that the editorial direction would be by the two associations He considered this a forward step and that the state associations would be brought into closer contact with the national associations He referred to *Science* for size and style, it would to some extent, take the place of the bulletins being issued He thought that national associations had an opportunity in this promotion to consolidate the pharmaceutical interests Information is needed on preparations There should be unison so that the several states can be informed regarding legislation He suggested that Secretary Kelly explain the project at some time during the session'

J Lester Hayman was of the opinion "that the publication under consideration should take the place of the *Bulletin* being issued by the N A R D from Washington This would be a combined effort of the two national associations, there would be no advertising in the proposed publication"

J G Beard said it would require some salesmanship to make the proposition acceptable in North Carolina, he would be met by the statement 'we are a little hard pressed' He hoped the proposition could be handled by an equal division of the necessary funds'

Roy S Warnack stated 'We get the *N A R D Journal*, giving most of the news and most of the information concerning legislative matter We get the *A Ph A JOURNAL* Then in the interim we come to realize the necessity of furnishing timely information to the secretaries with the result that we are getting a very splendid service now from the *N A R D* I don't know what advantage would be gained by all of the members receiving that *Bulletin* from the *N A R D* at the present time It is very helpful to the association secretaries It would take an appropriation of \$500 00 to get the approval of all the various associations throughout the country I don't know what would be accomplished by a joint organization except to make a mutually friendly and coöperative spirit If this sheet were to come out monthly or semi monthly it would not give us the timely news, which we need California issues its own bulletin That state bulletin is sent out as an enclosure with the sheets from the two major associations Timeliness is the main thing and we get it out while the news is hot "

R. C Wilson said that 'perhaps there are 60,000, in round numbers, drug stores in the United States The total membership of the *A Ph A* and *N A R D* is approximately 25 000 My view is that this proposition was aimed primarily at those who don't get any pharmaceutical literature It has been my observation that the average druggist reads less than those of any other group I know about If we can get them to read something, it would be worth while, whatever the expenditure It is the 50% that receive no literature that I was thinking about, and it gives an opportunity for the sale of full membership in the *N A R D* and the *A Ph A*, too "

E F Kelly, after explaining the tentative plans for the publication, presented the following "I move that the Conference of Pharmaceutical Association Secretaries express its approval of the effort of the AMERICAN PHARMACEUTICAL ASSOCIATION to issue a popular professional publication to be available to the members of the state associations "

Motion seconded and carried

R. C Wilson presented the following 'I wish to make a motion to go on record as approving and thanking the *N A R D* for the legislative bulletin issued by the Washington *N A R D* representative to state associations and we bespeak its continuance "

Motion seconded and carried

#### CONTINUATION OF THE DISCUSSION ON THE SECRETARY'S OBLIGATION

Mr Warnack—"The Secretary's obligation to the Industry and Profession in sponsoring state and national legislation is very concrete The Secretary is blamed for the failure of legislation but he does not receive much credit for its success As a matter of fact I don't think he should, although the idea might have come from his own fertile brain

"The Secretary has a definite obligation to the national organizations in an abstract way and he has a concrete obligation to every state association and every druggist within his state His duties are very definite

"The success of his position depends on how ardently he pursues the duties given to him If he owns a store, he has a vital interest in the legislature, because he has to live and work under the terms of the bills which are passed

"His first obligation is to his state, but when the legislation has proved to be sound he feels obligated to carry this to the nation Very often the legislative committee will find itself at a state legislature in the midst of legislation which it finds must be sponsored because often there is legislation introduced during the session of which they have no knowledge before going to the capitol They spring it on you when you know nothing about it

"Sound legislation offers a better opportunity for success if you are going to introduce it yourself Such progress usually takes the form of the introduction of resolutions either by an individual, or local organization at the state conventions These in turn, if acted upon favorably, become a mandate upon the association to carry out

"Referring to our California legislation which has caused much comment, our Fair Trade Act—I think that resolution was introduced by F E Mortenson at the 1931 meeting Caused a lot of talk and the resolution was adopted That particular bill and several others suggested at that time were carefully worked out, a legislative committee was appointed and the bills were then taken to the capitol

"A great deal depends, of course, upon the legislative committee and the Secretary It is my opinion that if they work, they should not be subject to change as other officers They get to know



the methods of the capitol and can carry proposals through. We have been fortunate because Messrs. Mortenson and Lenehan have had a great deal of experience with the ins and outs of the capitol and know how to go about the work for the best results. When you have men of that type they should be retained. They know legislative procedures and they stay at the post until after the legislature closes, because sometimes they have to convince the Governor that he should sign enacted bills.

"That gives you an insight on the method that we have employed to secure state legislation. When bills are taken to the national capitol, the obligation is placed upon the secretaries to carry them through. It is a very definite obligation. It places much work on the secretaries but I think it is an obligation they should assume.

'The method that this form of obligation took with reference to the Fair Trade Act was that after it was enacted we carried it through the courts and made all information concerning it available to the N. A. R. D.

There were two or three factors responsible for carrying this through to a successful completion. The first thing was to supply all the states with copies of the bill and a primary letter explaining the need for it. The next step was to supply information concerning arguments for the bill and how it might be carried through.

'Mr. Mortenson did much research work for it and made multigraphed copies and sent them to all the states interested in the Fair Trade Acts.

Another factor was Mr. Henry, president of the N. A. R. D., who was traveling over the country attending state conventions. I am satisfied that his talk before state bodies when they were wavering was responsible for at least two states getting theirs through. The third phase of the work—many of the states were floundering around and did not know what to do with it—did not know how to get the manufacturers to act, what form of contracts to use, what was legal and what was not.

The N. A. R. D. asked me to help—I prepared a folder making it as brief as possible but retaining the essential facts. I sent this to the N. A. R. D., thinking they would use it in the *Journal*, but they published it in bulletin form and distributed it to all the states operating under the Fair Trade Acts and sent it to every Senator and every Congressman, some copies were sold to manufacturers and the legal profession.

I think that secretaries can automatically become burden bearers—I think it is a duty they owe to the profession because the more we have the more we should give."

In the absence of Secretary J. W. Slocum of Iowa the chairman called on Charles J. Clayton to lead a discussion assigned to Mr. Slocum. The Secretaries' Obligation to the Industry in Promoting Sound Business and Fair Trade Practices."

Mr. Clayton said in part: Such business as we have would indicate that it is a desirability. We don't know how many prescriptions are written in the United States. A few years ago there was a survey in Maryland which showed that there were written annually possibly three prescriptions per capita. In the St. Louis Drug Survey it showed one and a half per capita in that district. I think about half way would mean 281,000,000 prescriptions a year and if those were divided equally among 60,000 drug stores that is over 4500 prescriptions per year per state. I would say that for many stores there is far greater opportunity for gain in securing the prescription practice than there is in trying to meet the prices of every one who sells merchandise as low as he can. The point I want to make is that there are a lot of druggists who are just forgetting about prescriptions—they forget that is a line they might get at a good price if they would.

There are many stores in small towns where the doctors do their own dispensing and even in the large cities many doctors do so. There are many druggists who for one reason or another will make no effort to secure prescription practice, consequently the total number will be divided not among 60,000 stores but not even among half that number. I think that the way back to prosperity for many stores is not commercially but professionally. 'Back to Pharmacy' would be a good motto for many retail druggists to adopt."

R. C. Wilson — I have had theories about this proposition of the professional work in the drug store. Mr. Clayton has expressed it adequately. He has said in a few words all that I might have said if I had talked at considerable length. We are going to attempt in Georgia, this association year, this sort of a proposition. We have been able to finance a full time secretary whose duties will be to go over the state. Whether I will have an official connection with the

association I can't say definitely at this time Theoretically I am at this time what they call an executive secretary We outlined this sort of a campaign for this man to put across

He is going into the drug stores of the state to sell membership in the association He is going to try to interest druggists in the manufacture of pharmaceuticals—U S P and N F—supply themselves with the proper equipment, where it is lacking, as it is in a good many places We are going to try to get each druggist to put in a library for his own reference and for the doctors of the community Also to arrange for discussions before every group of doctors in the state county and district societies on U S P and N F preparations and try to impress upon them the fact that the doctor himself has come to be a medium through which our most popular proprietary products are placed on the markets By his prescribing them or telling people to get them he is establishing a demand constantly for those proprietary products which are now in the hands of cutters department stores and other places We will endeavor to persuade these doctors to write prescriptions on official products, the price of which we can control and impress him with the fact that he is the medium through which the proprietary medicines are being introduced to the public Some of our most popular products are being cut to day in a way so there is no profit whatever We propose to bring that condition squarely before the medical profession If we can't sell them we are going to try to explain to the people of our state the fact that the high cost of medicine and medical care is a proposition for which the doctor is himself responsible I have three or four engagements already to go before district groups in the state, where there will be 250 to 300 doctors and there will be druggists present I am going to talk to them of their failure to prepare endorse and support the U S P and N F products I think if you will give us a year and then let me report to you it will be more interesting than any theory I might present at this time "

Mr Yeomans — It was my pleasure to inaugurate the U S P and N F campaign in Chicago which I think was the first real organized campaign put over in the United States Chairman Sisson of the U S P and N F committee in charge, was on that original committee and is still carrying on in the organization The group which was representative of Cook County met regularly and did some very constructive work We held joint meetings of physicians dentists and druggists and within a few months that made a very noticeable increase of such prescriptions in Chicago The work was carried on up to the time of the War and through the great changes undergoing in pharmacy at the time the work was temporarily abandoned but has since been re-organized with growing satisfaction "

Frank Nau, Portland — 'I hope you heard the paper by E Fullerton Cook relative to getting together and making a study of professional pharmacies I think the time is ripe for co operation between the different groups that are interested We have pharmacists in Portland who have improved their prescription departments and are using every effort to bring back the professional end of the business These men grouped together in the city of Portland about 75 or 80 have been attempting to contact the physicians and the dentists and we have progressed In our new pharmacy law we put in the U S P and N F requirements as to label The preparations must be by a graduate druggist who studies four years and learns how to manufacture U S P and N F products If he then sells ham sandwiches he will buy his U S P products He should know how to manufacture them and if he will do that he will cut his cost and be more interested in them "

It was moved that the meeting be adjourned —Carried and the meeting adjourned at 11 30

A M

EDITOR'S NOTE We are thankful for President F V McCullough's help in preparing this report

### TVA DECISION

The *Washington Post* in an editorial comments that "aside from the legal points which it clarified the Supreme Court's so-called TVA decision has served a most useful purpose For it clearly demonstrates that this high tribunal is only concerned with fair and accurate interpretation of the Constitution and not with the promulgation of any economic theories or social philosophy That aspect of

the decision should do more than anything else to end the campaign for limitation of the court's authority as the arbiter and guardian of the fundamental law "

### ISOPROPYL ALCOHOL BANNED

The use of isopropyl alcohol as a rubbing alcohol, in such a way as to mislead the consumer into thinking he is receiving ethyl alcohol, is forbidden by the Food and Drug Administration

# ASSOCIATION BUSINESS

## AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION 1935-1936

Office of the Secretary 2215 Constitution Avenue Washington D C

### LETTER NO 12

February 7, 1936

To the Members of the Council

81 *Minutes of the Meeting of the Council on December 5, 1935* Motion No 32 (Council Letter No 11, page 58) has been carried and the minutes are approved as corrected

82 *Bequest of Dr Frederick B Kilmer* Motion No 33 (Council Letter No 11 page 59) has been carried The release has been executed by the secretary and the bequest has been paid

83 *Contract for Printing and Mailing the Journal for 1936* Motion No 34 (Council Letter No 11, page 59) has been carried and the contract is awarded to the Mack Printing Company

84 *Budget for 1936* Motion No 35 (Council Letter No 11 page 61) has been carried and the budget is approved as submitted Dr Fischelis voted 'no'

85 *Selection of Auditors* Motion No 36 (Council Letter No 11 page 62) has been carried and W A Johnson & Co are selected to audit the accounts of the Association for 1935

86 *Election of Members* Motion No 37 (Council Letter No 11, page 62) has been carried and applicants for membership numbered 135 to 173 inclusive are declared elected

87 *Proposed Publication* The following letter has been received from H A B Dunning

I note in Council Letter No 11 1935-1936 page 59 that I have been appointed by Chairman Hilton as a member of the Committee on Ways and Means to provide for the proposed publication, as outlined in Council Letter No 10, page 1109

I am entirely in favor of the proposed study by the Committee on Contents Scope and Style, R L Swain *Chairman*, and also the investigation by the Committee on Ways and Means, C W Holton *Chairman* and am deeply interested and hope for a successful issue I do not however believe that I should be a member of the Committee on Ways and Means and am therefore declining the appointment

"You can be assured of my interest and coöperation in promoting the progress of the entire plan"

and Chairman Hilton has appointed H C Christensen a member of the Committee on Ways and Means to fill the vacancy

88 *Use of Text of N F VI* Requests for permission to use the text for partial reproduction have been received from Dr Herman Goodman in a book on the Use of Drugs in Modern Cosmetics and the Treatment of Common Skin Diseases, from the Tennessee School of Pharmacy in mimeographed notes for their students and from Professor George W Fiero in a revision of his book 'Review of Pharmacy'

These requests with samples of the manuscript were submitted to Chairman DuMez of the Committee on Publications and it is recommended that the requests be granted with the usual charge of \$5 00

(*Motion No 38*) It is moved by DuMez that permission be granted to Dr Herman Goodman, to the Tennessee Pharmacy School and to Professor George W Fiero, to use the text of the N F VI for partial reproduction, respectively in the publications mentioned above under the usual conditions and at a charge of \$5 00 in each case

89 *Applicants for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received

No 174, Mrs Theodore M Edison Llewellyn Park West Orange N J, No 175, Anthony William Anriola 4 Ravine Ave, Nutley N J No 176 Michael Anthony Dente, 180 Main Ave, Vineland N J, No 177 Bernard P McNamara 302 N Ellwood Ave, Baltimore, Md,

No 178, Carroll P Foster, 3036 E Monument St Baltimore, Md , No 179, Bertram Kamber, 2402 Lakeview Ave , Baltimore, Md , No 180, Raymond F X James, Library, Fordham University, New York, N Y , No 181, Israel Dan Fiertel, 775 Jennings St , New York, N Y , No 182, J H Barnett, 117 E Potomac St , Brunswick, Md , No 183, Oscar Loddy, 835 Main St., Fitchburg, Mass , No 184, Charles A Heyl, 22 W 9th St , Erie, Pa , No 185, Donald Albin Wallace, 8134 McCormick Blvd , Chicago, Ill , No 186, John R McClelland, 130 Bristol, New Haven, Conn , No 187, J K Kohser, 542 N Pine Ave , Chicago, Ill , No 188, Ray M Anderson 708 E Second St , Merrill Wis , No 189, Samuel David Goldberg, 2923 Atlantic Ave , Brooklyn N Y , No 190, Ralph J Mill, 625 Mullett St , Detroit, Mich , No 191, Valentine F Greene 18 Kensington Ave Jersey City, N J , No 192, Harold DeWitt Goulden, 57 Cobane Terrace, West Orange, N J , No 193, Frank Joseph Korinek, 1852 S Scoville Ave Berwyn, Ill , No 194, Arthur Garfield Raiche, 425 E Wisconsin Ave , Milwaukee, Wis , No 195 Wood Wheeler Goble, 403 Eddy Ave , Missoula, Mont , No 196 John Pasternacki, Virginia, Minn , No 197 Beal S Alstodt, 111-73 145th St , Jamaica, L I , N Y No 198 Arthur Philip Hess, 112 E Broad St , Elyria, Ohio, No 199, Oswald H Rotho, 210 Littleton Ave , Newark, N J , No 200, Robert R Gilmore, 2095 Honeywell Ave , Bronx, New York, N Y , No 201, Elder Charles Gauthier, Station Hospital, Fort Missoula, Mont

(*Motion No 39*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION

E F KELLY *Secretary*

## THE HEADQUARTERS BUILDING

In *The Sunday Star*, Washington, D C , there is an interesting discussion pertaining to the location of the Administration Building for the Pan-American Union, relative to which there has been some discussion by Secretary Iches and the President and the Fine Arts Commission

*The Sunday Star* states that back of the argument are more than thirty five years of history As long ago as 1901 it was suggested that Constitution Ave should be laid out as a marble thoroughfare leading to the Arlington Bridge Gradually the plan is progressing The Lincoln Memorial and the Memorial Bridge, the National Academy of Sciences and the building of the AMERICAN PHARMACEUTICAL ASSOCIATION, each a masterpiece of architectural design, were successive steps in what the Fine Arts Commission has considered the right direction

Comparatively recently the land between 18th and 19th Streets C Street north to E Street, was appropriated for a new Interior Building, now under construction, and it is regarding this construction that there is argument In discussing the matter, Dr Charles Moore refers to the section in which the AMERICAN INSTITUTE OF PHARMACY is located and it is the only part of the argument to which reference will be made and this only in reference to the Pharmacy Building

"For the past ten or twelve years the plan of flanking the Lincoln Memorial with a series of white marble semi public buildings has been in progress The A Ph A Building and the National Academy of Sciences, both land and buildings paid for from their own funds The Public Health Service Building is a government building When the AMERICAN PHARMACEUTICAL ASSOCIATION bought lots in the center of the square between 22nd and 23rd Streets it was insisted that an entire frontage facing Constitution Ave be purchased and thereon be constructed a marble building, advancing it from the line of the Science Building in order to enhance its individuality, the center one of the five spaces between 17th and 23rd Streets was purchased by the Federal Reserve Board, again marble was required, and again to give this important building special significance"

The AMERICAN PHARMACEUTICAL ASSOCIATION has met every request and has the full support of all concerned Dr Charles Moore's support is highly valued

James E Hancock, Baltimore pharmacist, president of the Society of the War of 1812, has been delivering addresses before various organizations and over the radio to arouse interest in the movement to bring the frigate Constellation back to Baltimore The launching of the Constellation in Baltimore, September 7 1797, practically marks the beginning of the U S Navy

# EDITORIAL NOTES

## AN APPRECIATION

Hon Albert C Ritchie a foremost citizen statesman governor of Maryland for four terms, died February 24th It is not for us to speak of his achievements in national and state affairs but of his recognition of pharmacy always ready to commend the profession as important in public health service He was a speaker at the Baltimore meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION and his Pharmacy Week messages expressed his appreciation of pharmacy During his administration the building for the University of Maryland School of Pharmacy was constructed he actively, supported representation of pharmacy on the Board of Health and in few states if any is pharmacy better represented due to his influence and support His valuation of pharmacy is in evidence, pharmacists mourn his passing and join in paying tribute to a great American citizen

## THE THERAPY OF THE COOK COUNTY HOSPITAL

In the *Journal of the American Medical Association* of February 1st there is another contribution by Dr Bernard Fantus on the above named subject In their elaboration these articles are submitted to the members of the attending staff of the Cook County Hospital by the Director of Therapeutics Dr Bernard Fantus These articles are a source of valuable information for pharmacists and should be carefully studied by them The subject referred to is entitled 'The Therapy of Coughs relative to which pharmacists should be informed, sixteen prescriptions are discussed at length whereby the important fact is impressed that one preparation cannot serve in the treatment of all coughs Dr Fantus presents a study of the prescriptions under a number of headings such as—the *Useful Cough*, the *Tight Cough*, the *Loose Cough*, the *Useless Cough*, the *Chronic Cough*, thereby pharmacists may obtain necessary information

The contributions of Dr Fantus are of great value to physicians and impress them with the importance of judgment in prescribing and pharmacists may gain a better understanding relative to some phase of dispensing and perhaps of their obligations As a result there is the opportunity of coöperation for better service

Prescribing and dispensing offer oppor-

tunities for mutual cooperation between physicians and pharmacists

## PERSONAL AND NEWS ITEMS

The retirement of Dr Reid Hunt, since 1913 professor of pharmacology at Harvard Medical School Boston has been announced He served in the University of Maryland School of Medicine in 1896, and after two years as tutor in physiology at the College of Physicians and Surgeons (Columbia) New York at Johns Hopkins University School of Medicine until 1903 as associate and as associate professor of pharmacology He was chief of the division of pharmacology of the U S Public Health Service from 1904 until 1913 In 1923 he was visiting professor to Peking Union Medical College and from 1920 to 1930 president of the U S Pharmacopoeial Convention He was chairman of the Section of Pharmacology and Therapeutics of the American Medical Association in 1908-1909-1910, a member of the House of Delegates in 1911-1912 and has been a member of the Council on Pharmacy and Chemistry of the Association since its inception in 1905 He succeeded Dr George H Simmons as chairman of the Council in 1927 His investigations have been of the first order and have found ready recognition both in America and in Europe and he has contributed much to the literature on his specialty Dr Hunt's plans for the future were not announced—Through the *Journal of the American Medical Association*

Col Wallace DeWitt has been appointed assistant to the surgeon general of the U S Army Major Gen Charles R Reynolds with the rank of brigadier general succeeding Brigadier General Matthew Delaney who retired November 30th

We have received from Dr Roland E Kreamers the following Semi Annual Reports of Schimmel & Co October 1900 and October 1901, April and May 1903, April and May 1906, April 1907, April 1909, April 1911, April 1914, October 1914 to April 1915, October 1915, annual 1921 *Bericht* Schimmel & Co April 1921, edition 1923 edition 1928, Centenary Volume 1929, annual 1929, 1930 1931

In appreciation of his many years of constructive service to pharmacy J H Haughton, secretary of the Florida State Board of Pharmacy for the past eighteen years president of the

Florida State Pharmaceutical Association during the fiscal year 1931-1932 and secretary of the same association from 1907 to 1925 was initiated as an honorary member of Iota Chapter, Rho Chi, Society of the School of Pharmacy, University of Florida, at its ninth annual banquet held at Gainesville, Monday evening, January 13th Mr Haughton was initiated into the society by W M Hankins, of Daytona Beach, also an honorary member

The toastmaster of the evening was Dr B V Christensen director of the School of Pharmacy

Dr Albert L Raymond, for nine years associated with the Rockefeller Institute of Medical Research, has been appointed director of the Research Laboratories of G D Searle & Co Chicago

Dean Frederick J Wulling was tendered a life time chairmanship of the scientific and practical section of the Minnesota State Pharmaceutical Association at the closing session of its fifty-second annual convention

The Dean has been head of the College of Pharmacy since its inception in 1892

The Veteran Druggists Association of Baltimore elected F C Purdum, President and George A. Bunting, Vice-President

Creighton University has presented a plaque to Howard Chamberlain Newton in grateful recognition of the loyal and efficient service, professor of pharmacy from 1914-1935 and dean of the College of Pharmacy, 1916-1935 " Professor Newton is now a member of the faculty of the Massachusetts College of Pharmacy

The University of Cincinnati has announced a new application of the University's co-operative system of technical training to begin in September Students will spend alternate periods in industrial plants and at the University During each of the two University periods they will receive a \$500 00 fellowship and free tuition The fellowship and the pay received in industry will amount to about \$1000 00 a year

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## OBITUARY

### MRS EMILY TAPPEN FAIRCHILD

Mrs Emily Tappen Fairchild, widow of Samuel W Fairchild who founded the firm of Fairchild Brothers pharmaceutical manufacturers now the Fairchild Brothers & Foster Company, died at her home in New York February 19th, after several months' illness She was eighty two years old

The late Samuel W Fairchild founded the Fairchild Scholarship

### WALTER J STURGEON

Walter J Sturgeon, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, who for almost half a century was one of Kittanning's (Pennsylvania) most prominent citizens passed away in Johns Hopkins Hospital, Baltimore, Md, on January 23, 1936, following an illness from pneumonia

For forty nine years until September 1934, Mr Sturgeon conducted Sturgeon's Drug Store on Market Street and he enjoyed an exceptionally wide acquaintance not only in the local community but in the entire state He took an active interest in drug association affairs and was a member of the National Association of Retail Druggists having been identified with that organization since its inception He was also a member of the Penn-

sylvania Pharmaceutical Association since 1900, and served as its president (1920-1921) In 1931 Mr Sturgeon was elected to Life Membership He is survived by his widow

### GEORGE L RAPPORT

Dr George L Rapport prominent in Connecticut Pharmacy member of the AMERICAN PHARMACEUTICAL ASSOCIATION, died at his home in Hartford February 1st, aged sixty years He was one of the founders of the Connecticut College of Pharmacy and untiring in his efforts in behalf of the institution For many years, he was a member of the board of trustees and treasurer of the College In recognition of his accomplishments in pharmacy, the Connecticut College of Pharmacy, in 1933, conferred upon him the honorary degree of Doctor of Pharmacy He was a former commissioner of pharmacy and a Past-President of the Connecticut Pharmaceutical Association

Dr Rapport was born in Russia on January 18 1876, part of his earlier education was received in Vienna, before coming to the United States in 1892 After attending Bacon Academy in Connecticut he enrolled in the College of Pharmacy of the City of New York where he was graduated in 1894 After his graduation,

until 1915, he conducted a pharmacy in Hartford. For a period of three years he directed the courses in pharmacy at the Hillyer Institute of the Hartford Y M C A.

The funeral was largely attended by pharmacists from all parts of the State. Dr Rapport is survived by his wife and two sons—Richard assistant to the State Banking Commissioner and Professor Victor A Rapport of the Connecticut State College.

## LAFAYETTE BENEDICT MENDEL

Dr LaFayette Benedict Mendel Sterling professor of physiological chemistry in Yale University, died on December 9, 1935 after an illness of eighteen months. He was born at Delhi, New York, on February 5 1872, and received both his undergraduate and graduate training at Yale where he was awarded the degree of A B in 1891 and that of Ph D in 1893.

## LEGAL AND LEGISLATIVE

### EXTRA NEW JERSEY PRESCRIPTION TEST SCHEDULED

Two examinations in place of the one originally scheduled prior to June 1st by the New Jersey Board of Pharmacy will be held on February 27th. The second examination will follow on May 14th. Dr Fischelis explains that changes in the registration requirements which will become effective in New Jersey on July 1st, coupled with the change from a minimum 4-year course and the advent of the new revisions of the U S Pharmacopoeia and National Formulary which become official on June 1st, have led the Board to arrange for the two examinations.

### VIRGINIA LEGISLATION

Three bills providing for the regulation of drugs have been introduced in the General Assembly of Virginia by Senator G E Heller Bedford druggist, and Senator J W Whitten of Tazewell.

One of these bills would prohibit the distribution of drugs and medicines by medicine shows another would provide for the inspection of drugs, and a third would provide for the regulation of the manufacture of drugs, medicines and cosmetics with registered pharmacies excepted. In all of these bills the State Board of Pharmacy would be the regulatory body.

### DISTRICT OF COLUMBIA

S 3514 has been reported to the Senate, with amendment proposing to regulate the manufacture dispensing, sale and possession of narcotic drugs in the District of Columbia (S Rept 1538). H R 8437 has been reported to the Senate, without amendment directing the Commission on Licensure to Practice the Healing Art in the District of Columbia to issue a license to Dr Arthur B Walker—*Jour A M A*, February 22nd.

### SUPREME COURT HOLDS CORPORATE PRACTICE OF MEDICINE ILLEGAL

The Supreme Court of Illinois, February 14th, in *People vs United Medical Service, Inc* held that a corporation cannot legally practice medicine in Illinois even though it attempts to do so through physician employees. It accordingly affirmed a judgment rendered by Judge M L McKinley of the Superior Court, Cook County, March 1935 ousting the United Medical Service Corporation from "the franchise occupation and business" of engaging in the diagnosis and treatment of human ailments. According to the *Chicago Tribune*, February 14th an attempt will be made to reorganize the corporation on a partnership basis, in the hope of avoiding legal difficulties. It is intimated however, that before attempting such a reorganization the corporation may ask for a rehearing from the Supreme Court of Illinois and appeal, if possible, to the Supreme Court of the U S.

### LOUISIANA DRUG CONTROL ACT

(a) No drug retailer shall use advertising whether printed radio or display or of any other nature which is intentionally inaccurate in any material particular or misrepresents merchandise in respect to its use, trade mark, grade, quality, quantity, size, origin, material content or preparation and no drug retailer shall use advertising or selling methods which tend to deceive or mislead the customer.

(b) No drug retailer shall use advertising which refers inaccurately, in any material particular, to any competitor or his merchandise prices values, credit terms policies or services.

(c) No drug retailer shall use advertising which lays claim to a policy or a continuing practice of generally underselling competitors.

(d) No drug retailer shall secretly give anything of value to a customer or to the employee or agent of a customer for the purpose of influencing a bill or statement of account to the employee agent or customer which is inaccurate in any material particular

(e) No drug retailer shall sell or offer for sale any merchandise upon a condition which involves a lottery, gamble or other element of chance

(f) No drug retailer shall permit any demonstrator or sales employee whose salary is wholly or partially paid by a manufacturer or distributor to work in his establishment, unless such demonstrator or sales employee is clearly and openly identified as the agent of such manufacturer or distributor

#### SECTION III

No drug retailer shall sell any drugs, medicines, cosmetics, toilet preparations or drug sundries at a price below the manufacturer's wholesale list price per dozen, nor, in the case of biologicals or other of the above-mentioned products which are not customarily sold in dozens of greater lots, sell such products at less than the manufacturer's wholesale list price per unit, plus a per cent to represent averaged overhead expenses, which is to be

arrived at arbitrarily in the manner hereinafter set forth and which is to be subject to amendment as dictated from time to time by accumulating experience

#### SECTION IV

The Louisiana State Board of Pharmacy is hereby designated as the Board of Arbitration to carry out the provisions hereinabove set forth in Section III of the Act

### AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS

Discovery last Summer of large deposits of glauber salt, estimated to total 20,000,000 tons, in the northwestern part of North Dakota by Federal relief workers was reported during the sessions of the American Institute of Mining and Metallurgical Engineers, held in the Engineering Societies Building New York, February 17th to 21st. The report was presented by Prof Irvin Lavine and Herman Feinstein of the University of North Dakota. The discovery was made, the report said, as the result of a survey confined primarily to three counties. Eight deposits in all were discovered and the survey provided work for sixty eight men from relief rolls and in addition gave employment to a number of graduate engineers

### BOOK NOTICES AND REVIEWS

*The American Illustrated Medical Dictionary* A Complete Dictionary of the Terms Used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Nursing, Veterinary Science, Biology, Medical Biography, etc. By W A NEWMAN DORLAND, A M M D, F A C S, Lieut Colonel M R C, U S Army, with the collaboration of E C L MILLER, M D. Seventeenth edition. Fabrikoid. Price \$7 00, Thumb index, \$7 50, 1573 pages, with 945 illustrations. Philadelphia & London W B Saunders Company, 1935

There are more than 5000 new words alone in the *New (17th) Edition*. The Terminology conforms to the standards of the American Medical Association, Society of American Bacteriologists, American Chemical Society, the B N A and other scientific bodies which adopted definite standards. It gives the pronunciation of every word—not just the accent. The derivation of words is a feature. It gives consideration to the historical aspect of words—name of discoverer or originator, with date. It gives chemical symbols and chemical formulas

All recognized signs and symptoms of diagnostic value, particularly the new ones, are included, the technique of elicitation stated and the significance indicated

The Dosage and Therapeutic Table is comprehensive, covering 37 pages arranged alphabetically. Dental and Veterinary Terms are defined

Medical Biographies are brief, but a source of ready information. There are 945 illustrations, more than one hundred in color

The Dictionary has gone through many revisions since 1900, and, in each of them, the information has kept pace with progress. Only few references are given as the Dictionary has been a standard for many years and is a library essential

*Grundriss der Geschichte der Deutschen Pharmazie* (The history of German pharmacy) By A ADLUNG Ph D, State Apothecary and member of the German Department of Health, and George Urdang, Sc D, honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION—for sketch see page 1259, December JOURNAL for 1932. Prepared, because of



the encouragement by the Society for the History of Pharmacy and the support of the German pharmaceutical profession. The work is dedicated to Hermann Schelenz. Price R M 28, published by Julius Springer, Berlin, Germany.

This comprehensive historical review of the history of German pharmacy, of 647 pages, is a most valuable work and should be placed in libraries relating to pharmacy. The Introductory depicts the early history and the relation to the present status of pharmacy. The first division deals with activities and the 15 subjects review systematically the legal phases, the apothecary's oath, reforms the activities within the pharmacy and outside relationships, dealing with the dispensing of drugs other than in the apotheker, the personnel relation to physicians, the hospital pharmacy, the publications and military pharmacy.

The second division is concerned with the development of pharmacy herbals, household remedies, etc. The third section discusses technical subjects measuring and weighing. The fourth division speaks of pharmacists in discoveries as citizens, etc. The concluding chapter is largely devoted to the library forms of medication, discoveries, the industry, discoveries in related fields, as chemistry.

This in a general way, but briefly gives an idea of the valuable work. Perhaps it would be sufficient to refer to the author, George Urdang, with whom American pharmacists are acquainted through his activities and writings to which reference was made in the sketch appearing in the JOURNAL A PH A for 1932. His ability and thoroughness bespeaks for the volume a place in the libraries as a reference book. It is a German print but pharmacy is not limited by language and the publication will be welcomed as an outstanding work relating to the history of pharmacy. The indexes of more than 130 pages include references to materia medica, educational institutions, publications of early and later periods, writers, research workers, etc.

The authors express the hope that pharmacists elsewhere will write histories of pharmacy in their respective countries.

*Incompatibilities in Prescriptions* sixth edition. By EDELL A. RUDDIMAN, Ph M M D, formerly professor of Pharmacy, Vanderbilt University, Research Chemist with Ford Motor Company—Adley B. Nichols, Ph D, B Sc, assistant professor in Operative Pharmacy, Philadelphia College of Pharmacy and

Science Publishers, John Wiley & Sons, Inc., New York. Price \$2 75.

Former editions have been extensively used in colleges of pharmacy. Numerous unofficial substances have been added but such substances have only been included if considered of marked importance. Many incompatibilities have been considered in preparations that may vary considerably from time to time.

Part I has been thoroughly revised and considerable revision was made in Part II, to this about 170 prescriptions have been added.

The work is well and favorably known and no further comment is necessary, at this time no close study has been made of the examples given and, therefore, no prescriptions are discussed in this notice. The co author Adley B. Nichols, has been active in revision work and is known also for the exhibits of U S P and N F preparations at state and national medical and pharmaceutical association conventions.

*The Extra Pharmacopœia of Martindale & Westcott* Vol II 20th edition 6<sup>3</sup>/<sub>8</sub> in by 3<sup>3</sup>/<sub>4</sub> in Pp 889, 22s 6d. The Pharmaceutical Press, 23 Bloomsbury Square, London W C 1, H K Lewis & Co. Ltd, 136 Gower St, W C 1. The preface sets forth the principal changes that have been made in compiling this edition. The section relating to the analytical notes on the chemicals and materia medica of Volume I has, for all practical purposes, been entirely rewritten. The revision of the pages dealing with nutrition has been extensive as might be expected. The sections on water analysis and on sterilization have been completely rewritten. Further formulas of proprietary medicines are included. The Analytical Addenda to Chemicals and Materia Medica in Volume I occupy 204 pages, a fact indicating the importance of possessing the complete work. The typography appears to us an improvement on that of previous editions. Tables and glossaries complete the information given as from the first appearance of the book, in a condensed and readable form.—*The Chemist and Druggist*, November 2, 1935.

We regret very much to advise that our fellow member, W. Bruce Philip, has been quite ill for a time and is in Garfield Hospital, Washington. He is improving slowly and we hope will soon be quite well again. Mrs. Philip returned from California to be with her husband.

# JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXV

MARCH, 1936

No 3

## FRANK A DELGADO

Frank Anthony Delgado, *First Vice-President* of the AMERICAN PHARMACEUTICAL ASSOCIATION, was born in Jacksonville, Florida. He came from a family of pharmacists, both his father and two uncles having followed that profession. One of the latter, Dr. Thomas W. Perrin, of Augusta, Ga., was a partner of Dr. Robert Land who for years was a member of the Georgia State Board of Pharmacy. F. A. Delgado's father obtained his early experience in the establishment of the other uncle, Robert Martinez. After becoming registered, he opened his own drug store in the suburb of Riverside, Jacksonville, Fla., in the 1890's. This was about the time of the Spanish American War and Mr. Delgado, the subject of this sketch, recalls quite vividly that Jacksonville was full of American soldiers on their way to Cuba, and while, later on, he was to play a part in a military conflict of importance, he never again experienced thrills much greater than witnessing General Fitzhugh Lee's troops parade on the streets of Jacksonville. It was in his father's store, beginning about 1901 or 1902, that F. A. Delgado served his early apprenticeship and he looks back and recalls with pleasure this period of about 35 years ago when pharmacy and pharmacists were held in rather high esteem in the community. At that time there were no chain stores in Jacksonville nor did the department stores stock many toiletries, much less medicines, many drug stores had not installed soda fountains, the term "curb service" was unknown, although ladies, in victorias and carriages, did sometimes drive up in front of the store to make purchases.

After graduating from High School, Mr. Delgado attended the Morris School of Pharmacy in Macon, Georgia, graduating in 1911. Shortly after graduation he passed the Georgia State Board of Pharmacy and returned to Florida, where he was employed with the J. Daniel Boone Drug Company until 1913, when he went into business for himself. In 1914, he sold his store and after a few months of leisure, decided, early in 1915, to again engage in the drug business, and opened his second drug store. He continued the successful operation of this business until 1918, when he enlisted in the Naval Service of the United States, reporting for duty to the United States Naval Hospital at Charleston, South Carolina, having in the meantime sold his store to his head clerk.

After undergoing a course of training at Charleston he was among ten making the highest mark in their examination, and was ordered to report to the Brooklyn Navy Yard for foreign service. Here his career nearly ended, as he was among the thousands who contracted influenza. However, he recovered and was drafted for service on the U S S Leviathan. Mr Delgado had many experiences while serving on the Leviathan and was afforded an opportunity of seeing bits of France and England during the many trips, back and forth, of the Leviathan. In April 1919 he secured an honorable discharge from the U S Navy and returned to Jacksonville, but had been there only a month or two when the wanderlust overtook him and he enlisted in the American Red Cross with the rank of Lieutenant and embarked for Siberia by way of Japan. He spent two months in Japan and shortly after his arrival in Siberia, was made Assistant Director of Civilian Relief. His principal duties, while in Siberia, consisted of aiding in the care of from 800 to 1000 Russian orphans and other children. Leaving Siberia in 1920 on a Japanese freighter he sailed three fourths the way around the world with an expedition, the purpose of which was to return these children to their point of origin, Leningrad, Russia. A book could be written regarding the experiences that befell those who participated in this voyage. The return of the children to their destination was only accomplished after many hardships, trials and tribulations on the part of those who participated in the project. Winter quarters had to be established in Finland, where Mr Delgado was placed in charge of medical, hospital and all other supplies. Leaving Finland in the Spring of 1921, he reported to headquarters at Paris and took advantage of accrued leave to visit Spain, the land of his father's ancestors. His trip was interrupted in Spain by orders to report to Prague, Czechoslovakia, to take charge of medical supplies and supervise their distribution to child welfare stations scattered throughout the Republic. The year following found him in Riga, Latvia, where he was now Director of medical warehouses and supplies in Latvia for the American Relief Administration, an activity headed by former President Herbert Hoover. It will be recalled that at the time Russia was being devastated by a famine. At the conclusion of his services with the American Relief Administration he reported to London on his way to the United States and there met and married, October 1922, Miss Olive F Sanders, of London, formerly of Connecticut.

He returned to the United States late in 1922 and after visiting his mother in Jacksonville, decided, early in 1923, to engage in the drug business in Miami, Florida. Mr Delgado received an offer for his business in 1925 and he and Mrs Delgado once again set sail for Europe on an extended tour of several months, and while in Europe visited some ten or more countries. They returned to Miami late in 1925 only to find that Miami was in a state of depression due to the collapse of the real estate boom. Mr Delgado had planned to engage in the real estate business. Needless to say this plan was abandoned and after experiencing the full force and fury of the hurricane of 1926, he decided to seek his fortunes elsewhere. About this time the A R A Association, an organization of former over-sea war time relief division was meeting in Washington, D C. The Delgados attended the meeting, and while in Washington he formed his present connection and became a member of the Chemical Division of the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce.

Early in 1931 he was assigned to the Merchandising Research Division to serve

as drug and chemical consultant for The National Drug Store Survey and to be in charge of the Prescription Phase of the Survey

Mr Delgado is the author of numerous articles and papers concerning various phases of the drug industry, both foreign and domestic. He is a joint author of "The Professional Pharmacy" (1933), a first edition of 10,000 copies of which met with such demand that a second edition was required, and "Prescription Department Sales Analysis in Selected Drug Stores" 1932, an outgrowth of the National Drug Store Survey

As technical adviser for the pharmacy exhibit he served the Century of Progress Exposition at Chicago. At present he is assistant secretary of the U S Pharmacopœial Convention (elected in 1930 for a 10-year term)

Mr and Mrs Delgado have one son, Frank Anthony, Jr, born September 13, 1927

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### ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1936 \*

Arrangements have been completed for the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION and affiliated organizations in Dallas, Texas, during the week of August 24th to 29th. At this time, the Texas Centennial Exposition will be in full operation. Those attending the meeting will have the opportunity of visiting an interesting section of the country and of seeing an exposition which celebrates one of the most important and romantic events in the history of the nation. Complete information about the Exposition will be available later.

Walter D. Adams will serve as *Local Secretary* for the meeting and Sam P. Harben as *Chairman of the Committee on Arrangements*. These gentlemen have had long experience in arranging for meetings of the Texas Pharmaceutical Association. They and their associates are organizing the various committees necessary for the work, are perfecting the arrangements for the business sessions and for the entertainment of the delegates and visitors during their stay in Dallas.

The Hotel Adolphus, the largest in Dallas, has been selected as the Headquarters for the meeting. It is located at Commerce and Akard Streets, near the business section of the city and has 825 rooms, all with bath. The rates are \$2.50 and up, single, \$3.50 and up, double \$4.00 and up, twin beds, and the charges for meals are equally reasonable. Several large hotels are located near the Hotel Adolphus and the Dallas Chamber of Commerce has pledged that accommodations will be available for all who may come. However, those planning to attend are urged to *make reservations promptly*.

Very favorable transportation rates will be available on account of the Exposition and many interesting and inexpensive side trips can be arranged by conferring with transportation officials. Because of the heavy travel expected at the time of the meeting, transportation arrangements should be made as promptly as possible.

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\* A. Ph. A. Bulletin No. 7, March 16, 1936

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### THE EXHIBIT OF LIFE AT TEXAS CENTENNIAL

Plans for an exhibit at the Texas Central Centennial Exposition to be held this year in Dallas, to be known as "The Exhibit of Life," were outlined at a conference of representatives of educational institutions of the state in Dallas, December 15th. Dr. Edward H. Cary, Dallas, was chairman of the conference. The exhibit will cover the development of all the sciences useful in the propagation and care of human life. The Texas State Medical Association will probably prepare as its share an exhibit of the medical history of Texas and participation of the medical profession of the state in the development of the practice of medicine. —*The Journal of the A. M. A.*, February 1, 1936

# EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave., WASHINGTON, D C

## SOCIAL IDEALS IN LEGISLATION

A VIEW of law that needs to be more generally understood is the adjustment of the frame-work of society, more and more, so as to permit liberty of individual action and yet exerts its force to draw up individuals to lofty ideals of common and social action. In this building-up of social ideals, in being permissive and creative, law will continue to develop in the minds of men a social consciousness that each is a living and vital part of the social whole, with duties as well as rights.

The growth—in both the demand and frequency of human cooperation in making life worth living and for the advancement of civilization—is dependent on the necessity and action of the individual, when planning a work to promote his comfort and success, to consider the effect it will have on the welfare of his neighbor, whether it imperils life, health, happiness or prosperity. Grave responsibility rests upon us in our daily activities, whether in business or elsewhere, and this responsibility cannot be evaded or disclaimed.

These comments were prompted by discussions in recent hearings on Fair Trade legislation.

## EBERT PRIZE AWARDS

1874-1935

ALBERT E. EBERT was president of the AMERICAN PHARMACEUTICAL ASSOCIATION 1872-1873. On September 12, 1873 he submitted a letter wherein the Ebert award was outlined. The following have earned the award and the titles of papers are given:

- 1874, Charles Mitchell (Philadelphia, Pa.) "On Active Principles of the Official Veratrum"
- 1877, Frederick Power (Washington, D. C.) "On the Resin of the Rhizome of Podophyllum Peltatum L."
- 1882, J. U. Lloyd (Cincinnati, O.), "Precipitates in Fluid Extracts"
- 1886, Emlen Painter (San Francisco, Calif.), "Spirit of Nitrous Ether"
- 1887, Edward Kremers (Madison, Wis.), "Volatile Oils Hedeoma Pulegioides and Andropogon Nardus"
- 1888, Joseph Geisler (New York) "Notes on the Morphometric Assay of Opium"
- 1890, Wm. T. Wenzell (San Francisco, Calif.), "Coloring Principles of Flowers"
- 1891, J. U. Lloyd (Cincinnati, O.), "A Scheme of Assaying"
- 1896, James W. T. Knox and Albert B. Prescott (Ann Arbor, Mich.) "The Caffeine Compounds of Kola"
- 1897, Virgil Coblenz (New York) "Gelsemic Acid"
- 1898, Henry Kraemer (Philadelphia, Pa.), "Quantitative Examination of Crude Drugs"
- 1899, Edward Kremers and Oswald Schreiner (Madison, Wis.), "Nitroso Derivatives of Caryophyllene and Cadinene and the Bearing on the Characterization and Classification of the Sesquiterpenes"
- 1902, J. O. Schlotterbeck and H. C. Watkins (Ann Arbor, Mich.), "Contribution to the Chemistry of Stylophorum Diphylum"
- 1903, Frederick B. Power (Washington, D. C.), "The Chemistry of the Stem of Derris Ulinosa"
- 1905, Dr. Ernest Schmidt (University of Marburg, Germany) "Concerning Choline Neurine and Allied Compounds"

- 1906, J O Schlotterbeck and H C Watkins (Ann Arbor, Mich ) ' Contribution to the Chemistry of Chelidone "
- 1907, Frederick B Power and Frank Tutin (Washington, D C ) "A Chemical Examination of Eriodictyon "
- 1908, A. B Stevens and L E Warren (Ann Arbor, Mich ), "Poison Sumach "
- 1909, Henry Kraemer (Philadelphia, Pa ), ' Some of the Distinguishing Morphological Characters of Belladonna and Scopolia "
- 1910 Harry M Gordin (Chicago Ill ) ' The Crystalline Alkaloid of Calycanthus Glauca "
- 1911 W A Puckner and L E Warren (Chicago Ill ), ' The Composition of Strychnine Arsenate and the Composition of Commercial Copper Citrate "
- 1915, E N Gathercoal (Chicago Ill ), "The Pharmacognosy of the Medicinal Rhamnus Barks "
- 1916, J U Lloyd (Cincinnati Ohio), ' Adsorption Powers of Hydrated Siliceous Earths "
- 1919 Arno Viehoveer, C O Ewing and J F Clevenger (Washington, D C ), 'Some Commercial Viburnum Barks and Preparations "
- 1920, George D Beal (Chicago Ill ), 'Immiscible Solvents in Connection with Their Use in Alkaloidal Assaying "
- 1921, Albert Schneider (Lincoln, Nebraska), "Micro-Analytical Methods "
- 1922, W L Scoville (Detroit, Mich ), "Hot Extraction of Drugs "
- 1923 Paul S Pittenger (Philadelphia, Pa ), "The Biological Standardization of Local Anesthetics," "Isolated Uterus Assay for Pituitary Extract "
- 1924, H V Army (New York, N Y ), "Standardized Color Fluids "
- 1925 H W Youngken (Boston, Mass ) ' The Anatomy and Botanical Position of Miré "
- 1926 J A Handy and L F Hoyt (Buffalo, N Y ), "Diethylphthalate "
- 1927 L W Rowe (Detroit, Mich ), 'Colorimetric Assay of Digitalis "
- 1928, E E Swanson (Indianapolis, Ind ), 'Standardization of Digitalis Preparations, Nuxvomica, Gelsemium and Veratrum Hydrogen Ion Concentration Factor "
- 1929 John C Krantz, Jr (Baltimore Md ), ' The Buffer Capacities of Acacia and Tragacanth "
- 1930, M R Thompson (Baltimore Md ), 'The Pharmacology of Ergot "
- 1931 H W Youngken (Boston Mass ), "The Pharmacognosy and Pharmacology of Viburnum "
- 1932 Zdenek F Klan (Praha, Czechoslovakia), "Influence of Period of Vegetation and Development of Plants on the Alkaloidal Content of Hyoscyamus Niger L "
- 1933, Ewin Gillis and H A Langenhan (Seattle, Wash ) "A Phytochemical Study of Hydrastis Canadensis "
- 1935, Marvin J Andrews (Baltimore Md ) "Determination of the Reasonable Permissible Margin of Error in Dispensing "

## LIST OF RESEARCH PROJECTS CONNECTED WITH THE REVISION OF THE NATIONAL FORMULARY (1931-1935)

PUBLISHED IN THE JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

THE FOLLOWING titles of published papers speak for the contributory services of the authors in the revision of the National Formulary They are published as evidence of valued services and appreciation and as a reference for those who seek the information

- W B Baker— "Suggested Assays for Some N F Preparations," January 1933, page 25
- J C Bauer—"Suggested Assays for Some N F Preparations," March 1932 page 244
- Geo D Beal, J Rosin and C R. Szalkowska— Carbo Activatus " August 1935, page 630
- W P Briggs—"A Phytochemical and Pharmacological Study of Mitchella Repens Linne N F V," March 1931, page 224
- F S Bukey and M Brew—"The Value of Tolu Coating U S P X and N F V " April 1935, page 291
- A H Clark and E Kirch—"Potassium Guaiacol Sulphonate," July 1935 page 564
- J F Clevenger— Preliminary Investigation of Certain Physical and Chemical Properties of the Volatile Oils from Authentic Plant Products " January 1932, page 30

- W G Crockett, W M Frayser and G V Thompson—"The Behavior of Ethyl Nitrite in Copaiba Emulsions," November 1932, page 1153
- H G DeKay and C O Lee—"A Study of the Change in  $p_H$  of the Official Elixir Ferric Pyrophosphate, Quinine and Strychnine, N F V," April 1933, page 316
- Dr Bernard Fantus and C M Snow—"Syrup of Potassium Guaiacolsulphonate," May 1931, page 473
- Dr Bernard Fantus, H A Dyniewicz and J M Dyniewicz—"A Study of Vehicles for Medicines"
- '1 The Eriodictyon Preparations " April 1933 page 323
  - 2 Aromatic Elixirs," July 1933, page 655
  - '3 Iso Alcoholic Elixirs," August 1933, page 751
  - '4 Elixir of Phenobarbital," February 1934, page 127
  - 5 Elixir of Amidopyrine " February 1934, page 129
  - '6 Compound Elixir of Chloral and Bromide," March 1934 page 232
  - 7 Syrup of Cinnamon " July 1934 page 699
  - 8 Aromatic Syrup of Acacia," August 1934, page 812
  - '9 The Glycyrrhiza Vehicles " September 1934, page 915
  - 10 Fruit Syrups " January 1935, page 46
- E N Gathercoal—"Report of the Committee on Unofficial Standards," February 1930 page 191, April 1931, page 385
- E N Gathercoal—"Report on Extent of Use of N F V Galenicals," February 1931 page 166
- E N Gathercoal—"The U S P N F Prescription Ingredient Survey of 1931," March 1932 page 277
- E N Gathercoal—"Use of Fluidextracts during the Past Fifty Years " February 1932, page 159, March 1932 page 274
- E N Gathercoal, R S Adamson and R K Snyder—"The Tests for Redistilled Water in the National Formulary VI Monograph," September 1935 page 800
- S W Goldstein—"Suggested Assays for Some N F Preparations," February 1932 page 128
- D C Grove and E M Hoshall—"Assay Methods for Some N F VI Preparations Containing Bromides June 1933, page 545
- W J Husa and A P McLean—"History of the Calcium Lactophosphate Preparations," January 1935, page 58
- W J Husa and Louis Magid—"Drug Extraction I A Study of Various Menstrua from the Standpoint of Swelling Effects, Penetration and Extraction " September 1934 page 891 October 1934 page 980, November 1934, page 1097
- W J Husa and C L Huyck—"Drug Extraction II The Effect of Fineness of Powder and of Variation in Solvents on the Percolation of Belladonna Root " June 1935, page 446
- W J Husa and S B Yates—"Drug Extraction III The Function of Preliminary Maceration in Relation to the Percolation of Belladonna Root " July 1935 page 538
- W J Husa and Paul Fehder—"Drug Extraction IV The Effect of Variation in Solvents on the Extraction of Jalap," August 1935, page 615
- W J Husa and Louis Magid—"Drug Extraction V The Extraction of Belladonna Root with Glycerinic Menstrua," October 1935, page 839
- Glenn L Jenkins and E M Hoshall—"The Assay of Preparations Containing Pepsin Official in the National Formulary " July 1933 page 625
- Glenn L Jenkins, E M Hoshall and D C Grove—"The Assay of Caffeine Sodio-Salicylate and Elixir of Sodium Salicylate " February 1934, page 118
- Glenn L Jenkins and S Millett—"The Assay of National Formulary Preparations Containing Bismuth " July 1935 page 561
- Glenn L Jenkins and M F W Dunker—"Assay for Phenol in Official Preparations," October 1935 page 840
- E A Kelly and E V Lynn—"Chemical Study of Senecio Aureus " August 1931, page 755
- H A Langenhan and E Gillis—"A Phytochemical Study of Hydrastis Canadensis (Goldenseal) " March 1931, page 210, April 1931 page 329
- H A. Langenhan and E Guth—"Studies in Extraction as Applied to N F Preparations " August 1931 page 746
- H A Langenhan and R. A. Cain—"Liquor Calcis Sulphuratæ," April 1934, page 344

- C H LaWall and J W E Harrison—"Chondrus Bleached with Sulphur Dioxide," November 1932 page 1146
- C H LaWall and J W E Harrison—"The Arsenic Content of Chondrus," April 1934 page 308
- D L Macht and H M Cook—"A Pharmacological Note on Cnicifuga," April 1932, page 324
- A O Mattheus—"The Effect of Storage of Distilled Water in Glass Ampuls on the Alkalinity and Total Solids Content," August 1931, page 767
- S W Morrison—"Amaranth as a Substitute for Cudbear with Improved Methods in the Preparation of Some N F Galenicals," November 1933 page 1112
- J C Munch, G E Byers and W F Reindollar—"Proposed U S P XI and N F VI Standards for Anthelmintics," November 1932, page 1158
- J C Munch and W J Stoneback—"Comparative Pharmacognostic and Pharmacological Studies on Apocynum Cannabinum and Apocynum Androsæmifolium," November 1932, page 1158
- W L Scoville and L W Rose—"Tincture and Fluidextract of Digitalis," February 1932, page 160
- E V Shulman—"Suggested Assay for Spirit of Formic Acid," February 1932, page 130
- E V Shulman—"Suggested Assay for Anisated Spirit of Ammonia," February 1932, page 131
- L E Warren—"Resin of Ipomea," March 1932, page 217
- E H Wirth, L E Martin and P G Soderdahl—"Studies on Cudbear," November 1935, page 949
- H W Youngken—"The Pharmacognosy, Chemistry and Pharmacology of Viburnum"
- I Introduction History, Botany and Pharmacognosy of Viburnum Prunifolium L, Viburnum Ruridulum Raf, Viburnum Cassinoides L and Viburnum Nudum L," July 1930, page 680
- "II History, Botany and Pharmacognosy of Viburnum Lentago Linné," April 1931 page 315
- "III History, Botany and Pharmacognosy of Viburnum Opulus L var Americanum (Miller) Ait," May 1932, page 444
- H W Youngken—"Studies on Commercial Psyllium Seeds," December 1932, page 1265
- H W Youngken and A W Reed—"A New Field of Investigation in Pharmacognosy The Microscopy of Glandular Products," December 1933, page 1215
- H W Youngken—"Psyllium Seed II So called Adex Psyllium," May 1934 page 397
- H W Youngken—"Further Studies on Psyllium Seed," March 1935 page 207

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*References to papers not published in the JOURNAL A P H A, follow*

- C C Platt—"Lichens Occurring upon Official Drugs" *Proceedings of the International Congress of Plant Sciences*, 2 1382-1384
- K H Rang—"Tinctura Iodi Decolorata" (*Thesis submitted for the Master of Science Degree*) Published 1925
- E H Wirth and J A Dorjahn—"Phytomicrochemical Tests as Pharmacopœial Identity Tests" *American Journal of Pharmacy*, Volume 101, September 1929
- E H Wirth—"A Quality Standard for Crocus" *Ibid* Volume 101 October 1929

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## U S P AND N F PUBLICITY PROGRAM IN WASHINGTON

Arrangements are being completed for a meeting in the AMERICAN INSTITUTE OF PHARMACY on April 9th On this occasion an instructive program will be presented, dealing with U S Pharmacopœial and National Formulary subjects and products of these standards will be part of an interesting exhibit

Delegates to the Pan-American Medical Congress will be in attendance and officials of the Revision Committees members of the faculties of colleges of pharmacy and it is hoped to have a large attendance of pharmacists and a representative number of physicians dentists and others engaged in medical and pharmaceutical activities

Part of the program will comprise a Symposium on the new U S Pharmacopœia, Spanish Edition and another—a Symposium on Pharmacopœia XI and National Formulary VI Invitations are extended to physicians medical and surgical interns medical students dentists, pharmacists and pharmacy students



# SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS — *Chairman*, F E Bibbins, Glenn L Jenkins, John C Krantz, Jr  
Heber W Youngken L W Rowe L W Rising, C O Lee, E V Lynn, W G Crockett  
Frederick V Lofgren

## RATIONAL USE OF THE EARTHWORM FOR THE EVALUATION OF VERMICIDES \*<sup>1</sup>

BY GLENN L JENKINS AND L LAVAN MANCHEY<sup>2</sup>

In the course of an investigation on the relation between vermicial activity and chemical constitution it became necessary to find or evolve a biological method of evaluation which would express the vermicial effectiveness of individual molecules. The general character of the research made it mandatory that the method to be followed should not require the use of excessive amounts of the material under study because of the limited quantities that were frequently obtained by synthesis. It was also desired that the method adopted be simple, rapid and afford activity values referable to a suitable standard.

It was recognized that the soundness of any method which claims for its objective the correlation of activity with structure depends for its validity not upon a rational principle of evaluation alone, but also upon the exclusion of those factors, such as tolerance of the host to the drug, which have no direct bearing upon the simple intent of the investigation. No attempt was made, therefore, to establish the ultimate values of the compounds in therapeutics. Indeed, to achieve this end would require the perfection of a method embracing so many considerations as to attach doubt to the method.

From the standpoint of applied therapy, the method followed by Hall and co-workers (1, 2, 3), using dogs, is highly informative, because it embraces both the parasitotropic and organotropic factors. This method, however, was not suitable to the existing conditions of experiment. Moreover, the expression "per cent efficiency," which is in reality a measure of the number of parasites eliminated, does not reflect the activities of individual molecules—a knowledge of which chemotherapeutic research demands as the most authentic datum for comparing activities.

*In vitro* methods employing the worms as experimental animals have been applied according to two general concepts. Either strips of worm muscle are mounted in a tissue chamber and the muscular responses are recorded with the aid of a kymograph, or the effect of the agent is determined by its direct action on the intact object. As will be shown later both methods are open to serious objections if used for studies intended to relate pharmacological activity with chemical structure.

The evolution of the muscle strip methods may be traced through the efforts of

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\* Scientific Section A Ph A, Portland meeting 1936

<sup>1</sup> From the Department of Pharmaceutical Chemistry University of Maryland, School of Pharmacy

<sup>2</sup> Abstracted in part from a thesis submitted by L Lavan Manchey to the Faculty of the Graduate School of the University of Maryland in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Trendelenburg (4), Straub (5), Toscano-Rico (6), Gluschke (7) and others. The authority for these methods depends upon the opinion, long held, that anthelmintics are effective by virtue of a specific action on worm muscle. It seems obvious that by these methods the responses of the tissues measure the irritant properties of a substance to a greater extent than they do any specificity of action attributable to atomic groups or linkages of the molecule. Here, the refinements of measurement depend upon an accurate interpretation of the relation between the tonic and clonic phases of the tissue contractions and upon the reversibility of the processes. The likelihood of these phases being functions of concentration and time of exposure rather than specific action is apparent. Gluschke (7), by highly critical analysis involving careful considerations of concentrations of solutions, character of contractions and tonus increase, concluded that substances such as phenol, cresols, xylenols, thymol, picric acid and naphthols do not possess a specific santonin-like action.

Admitting the truth of the statement, this argument does not dispose of the fact that a number of substances, such as thymol, which Gluschke says are not santonin-like in action, have proven their merit in the hands of fieldworkers combating helminthic infestations. It points only to the limitations of the method in failing to provide a means of comparing the activities of those substances which exert their toxic properties through some tissue other than muscle or are effective because they act through some other route or by some other mechanism.

Among the methods based upon the use of worms as test animals, leeches, earthworms, fish, frogs, vinegar eels and the endoparasites themselves (especially ascarids) have been employed under various experimental conditions. Of these, the classical test object has been the earthworm, since Sollmann (9, 10) demonstrated that all clinical vermicides are markedly toxic to this animal. The effectiveness of the vermicide is based usually upon the survival times of the worms when they are exposed to the action of the substance in a suitable solvent. Schneider (8), however, used as criteria of activity the rates of contraction and relaxation, and to the degree of shortening of the clitellum.

The most common objection to the use of this animal is that it is more sensitive to active substances than the pathological parasites. While the earthworm is more sensitive to chemical agents than the endoparasitic worms, the latter are more susceptible to environmental influences. It is, therefore, difficult to determine to what extent the response of the parasite is caused by its unnatural environment and to what extent by the medicinal agent.

Recently, Butz and LaLande, Jr. (11) have emphasized the importance of using the parasite for which an anthelmintic is sought in determining the probable anthelmintic value of a given substance. In a study of the effects of some oxygenated terpene hydrocarbons upon *Ascaris lumbricoides* they minimized the objectionable influence of environmental conditions upon ascarids by maintaining a temperature of  $37.5^{\circ}\text{C} \pm 0.5^{\circ}$  during the course of the experiment and by limiting the period of observation to five hours. While their method introduces a refinement in technique, the limitation of the observation period imposes the necessity of emulsifying many substances in order to afford concentrations sufficiently high to produce paralysis or death within the stipulated time. It does not seem likely that data obtained by the use of emulsions is accurately comparative with that of true

solutions unless the stability of an emulsion, the degree of dispersion and the emulsifying agent do not influence the measured activity

In view of the foregoing discussion, the skepticism directed against the use of the earthworm as a test object for the evaluation of anthelmintics is to a great measure justified. Yet, in spite of the objections cited, a number of inferences may be drawn in favor of further study of the quantitative responses of the earthworm to anthelmintics. (A) No scientifically valid expression for vermicide activity, based upon the use of the intact earthworm, either in terms of absolute or comparative units, has been utilized. Symbols such as "+," "-+," "++," etc., for designating effectiveness exist chiefly for need of a more accurate and descriptive designation, (B) The greater susceptibility of earthworms over ascarids and other parasites provides for a more sensitive method, (C) A more sensitive test object will detect weaker activity and the use of solutions holding lower concentrations of solute is made possible, thus tending to obviate the necessity of emulsifying many substances.

Earthworms, with regard to their wide availability and the ability to withstand environmental changes are well adapted for routine laboratory experimentation. They may be kept for months in moist earth and will live during the winter months in a warm room, if the ground in which they are placed is moistened frequently with water.

#### EXPERIMENTAL

In a preliminary study, it was found that earthworms will live in distilled water for from several days to a week or longer, but that they survive for much longer periods in 0.2 to 0.4 per cent solutions of sodium chloride. In normal saline solution, they show irritation and severe distress symptoms. In 0.3 per cent saline solution, however, three out of three worms were still alive three weeks following immersion. The observation was also made at this time that a number of substances which proved to be toxic to the earthworm produced similar effects along the course of action. The phenomena of toxicity appeared always in the same order: here mentioned *i. e.*, excitement and irritation passing directly to a stage of clonic or tonic clonic convulsive movements, followed by loss of irritability, paralysis, impaired dorsal circulation and death. If the convulsive movements are very severe, rupture of the body wall is likely to occur. In the paralysis stage the segments posterior to the clitellum are the first to be affected. The segments anterior to the clitellum are affected in ascending order. Feeble movements of the prostomium persist for some time after the worms have become otherwise immobile. The convulsant stage is relatively short in duration and may not be observed if the different phases follow one another in rapid succession. Complete cessation of movement is not a proof of death, since by transferring completely paralyzed worms to very dilute saline solutions the power of movement is frequently restored and revival is often complete in several hours, although death may ensue.

It was concluded that the death point is a more suitable and exact criterion of vermicide activity than any of the other phenomena of toxicity noted. A technique was then developed which made possible the determination of the death point with fair accuracy.

It became apparent that it would be impossible to utilize the same concentrations for all vermicides, owing to the fact that many of the less soluble ones do not afford solutions of sufficiently high concentration to cause death in a time which would be comparative with that of the more soluble substances. The inability to find a suitable common concentration for the preparation of all solutions or to hold invariable a given time corresponding to a range of concentrations suggested a study of the survival time-concentration relation for several substances, with the object of finding a mathematical expression which would permit the calculation of activities under either identical conditions of time or concentration.

*Technique of Method*—The test objects were sound, vigorous specimens of *Lumbricus terrestris* of fairly uniform size, measuring 8 to 12 cm. in a relaxed state.

**Object**—To determine the time in which a vermicide is fatal, at a given concentration to a definite number of earthworms. In our studies, the death point was chosen as that time which would just permit the survival of one of three worms at the concentration used.

**Procedure**—The worms are immersed in a solution of known concentration of the substance to be tested, 10 cc. of solution being allotted to each worm used. At intervals, depending upon the concentration employed, three worms are removed at one time by means of a blunt hook, adhering mucoid secretion is removed carefully with cloth or blotting paper and they are then placed in 150-cc. beakers containing 100 cc. of 0.3 per cent sodium chloride solution prepared with distilled water. After 18 hours the worms in each beaker are examined. By noting the number that have died or recovered in each case, it is possible to determine at a given concentration, approximately within what time range the death point or survival time lies.

Two or three series or groups of twelve worms each are required for a given concentration. The first group is used for ordinal tests. Three worms are transferred from the solution of the vermicide to the resuscitation bath<sup>1</sup> at 1-, 2-, 4- and 8-hour intervals, respectively.

The second and third groups of worms are used to define more accurately the time limits within which the true survival time lies. Closer time intervals for removing the worms are observed for solutions which cause death speedily than for solutions which require longer periods to be effective.

**Survival Time-Concentration Relation**—This relationship was derived by graphing the data obtained through the use of thymol, carvone and pulegone by the method described. These data are recorded in Table I, and are represented graphically in Fig. 1.

TABLE I

Compound	Minutes (t)	Moles/Liter (C)	C/t	Log C/t
Thymol	3	0.0025	0.000833	-3.08
"	7	0.0020	0.000286	-3.54
"	15	0.0015	0.000100	-4.00
"	35	0.0010	0.0000286	-4.54
Carvone	25	0.007	0.00028	-3.55
"	35	0.006	0.000171	-3.77
"	55	0.005	0.0000909	-4.04
"	110	0.003	0.0000273	-4.56
"	180	0.002	0.00001110	-4.95
Pulegone	40	0.004	0.0001	-4.00
"	80	0.003	0.0000375	-4.43
"	135	0.002	0.0000148	-4.83

Thymol, recrystallized from alcohol, was adopted tentatively as a standard or reference substance, because it possesses recognized value as an anthelmintic and has wide range of effective concentration.

In Fig. 2, the function  $\log_{10} C/t$  plotted as ordinates and C the abscissæ graphed from the data in Table I are seen to be in linear relation.

C is concentration (moles/liter), t the survival time in minutes

$$\frac{C}{t} = \frac{\text{concentration}}{\text{survival time}} = \frac{\text{moles/liter}}{\text{minutes}} = \text{"apparent" speed of fatality}$$

<sup>1</sup> In the resuscitation baths, the substances that have caused paralysis become washed from the tissues and muscular contractility is rapidly regained. The renewed activity appears to be purposeless and, therefore, independent of higher innervation. It may be dependent upon the intrinsic contractile function of worm muscle and should not be interpreted as an indication of permanent recovery. In the final examination to decide upon the number of worms that have recovered, a beam of intense light or direct mechanical stimulation are useful in initiating movements in the recovered test objects. It is helpful also to examine the dorsal blood vessel for the condition of the circulation. A turbid appearance of the solution or the detection of putrefactive odor are certain indications of death.

$C/t$  cannot be regarded as the absolute speed of fatality. It is designated *apparent* speed of fatality because it is not known how much of the dissolved agent is directly responsible for the death of the test objects.

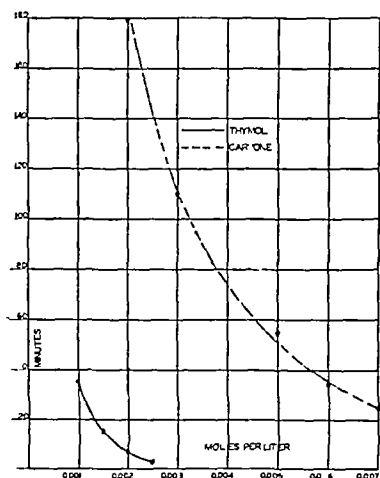


Fig 1

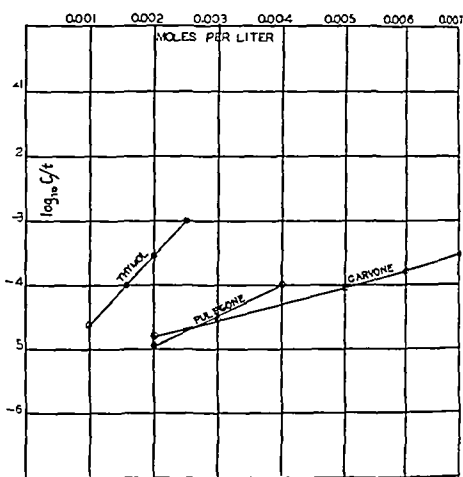


Fig 2

The empirical linear equation is

$$(1) \quad \log_{10} C/t = A + BC$$

where  $B$  is the slope  $\left( \frac{\Delta \log_{10} C/t}{\Delta C} \right)$  and  $A$  the intercept on the  $Y$  axis. In exponential form, (1) becomes

$$(2) \quad C/t = ae^{bC}$$

The relation between the constants  $A$  and  $B$  of equation (1) to  $a$  and  $b$  of equation (2) is

$$A = \log_{10} a$$

$$B = b \log_{10} e = 0.4343 b$$

The values for constants  $A$  and  $B$  are obtained from the graphs (Fig 2).  $A$  is the apparent speed of fatality at zero concentration obtained by extrapolation.  $B$  is computed according to the expression

$$B = \frac{\Delta \log_{10} C/t}{\Delta C}$$

Substitution of the computed values for the thymol curve in equation (1) gives

$$(3) \quad \log C/t = -5.6 + 1040 C$$

For carvone

$$(4) \quad \log C/t = -5.3 + 250 C$$

The usual criterion of potency in biological assay methods is the dose that will cause a definite physiological effect in a stipulated time. Time is usually fixed as one of the conditions of experiment. Potency varies in an inverse sense with the minimum effective dose and the potency of an unknown substance in relation to a reference substance is expressed by the ratio

$$\frac{\text{Weight of standard (s)}}{\text{Weight of unknown (r)}}$$

In the present study, the concentrations of the standard ( $C_s$ ) and of the unknown ( $C_r$ ) may be substituted for weight of standard and weight of unknown, because the same volume of solution per worm is used in each test

$$\frac{\text{Potency of } r}{\text{Potency of } s} = \frac{(\text{weight})_s}{(\text{weight})_r} = \frac{(\text{weight})_s}{(\text{volume})_r} = \frac{C_s}{C_r}$$

Since the relative activities of two vermicides are in proportion to the reciprocals of the concentrations at which they act at equal apparent speeds in producing identical physiological effects, then

$$\frac{\text{Activity of } r}{\text{Activity of } s} = \frac{1}{\frac{1}{C_r}} = \frac{C_s}{C_r}$$

(5)

and when apparent speed of standard ( $s$ ) = apparent speed of vermicide ( $r$ )

$$\begin{aligned} (C/t)_s &= (C/t)_r \\ \log (C/t)_s &= \log (C/t)_r \end{aligned}$$

From equation (1)

$$\begin{aligned} A_s + B_s C_s &= A_r + B_r C_r \\ B_s C_s &= (A_r - A_s) + B_r C_r \end{aligned}$$

For active substances ( $A_r - A_s$ ) is insignificant

$$\begin{aligned} B_s C_s &= B_r C_r \\ C_s/C_r &= B_r/B_s \end{aligned}$$

Substituting in (5)

$$\frac{\text{Activity of } r}{\text{Activity of } s} = \frac{B_r}{B_s} \text{ (at equal apparent speeds of fatality)}$$

It is thus shown that the activities of two vermicides are to each other as the ratio of their rates of change of log apparent speed of fatality with change in molar concentration and that  $B$  the slope is a suitable criterion of activity

$$(6) \quad \frac{\text{Activity of carvone}}{\text{Activity of thymol}} = \frac{B}{B} \frac{(\text{carvone})}{(\text{thymol})} = \frac{250}{1040} = \frac{0.24}{1.00}$$

If the relative activities of two vermicides are determined from the graphs by comparing the concentrations corresponding to equal values for  $\log (C/t)$  the coordinates should be extrapolated to the higher concentrations to obtain the most nearly consistent values. The higher concentrations conform more nearly with the doses given in actual treatment and give more consistent values over a wider range of concentration.

It may be more evident that the constants  $B_r$  and  $B_s$  in equation (5) are expressive of molecular activity, if the ratio  $0.24/1.00$  is derived in another way.

If the molar vermicide activity" ( $V$ ) be defined as log apparent speed of fatality ( $\log C/t$ ) when the vermicide is acting at unit molar concentration then, when  $C = 1$ , let the molar vermicide activities of two substances  $r$  and  $s$ , be to each other as the ratio  $V_r/V_s$ . Then

$$\frac{V_r}{V_s} = \frac{\log (C/t)_r}{\log (C/t)_s} = \frac{(\log C_r - \log t_r)}{(\log C_s - \log t_s)}$$

$$C_r = 1$$

$$C_s = 1$$

$$(7) \quad \frac{V_r}{V_s} = \frac{0 - \log t_r}{0 - \log t_s} = \frac{\log t_r}{\log t_s}$$

For thymol, at unit molar concentration

$$\log (C/t) = -5.6 + 1040 \times t$$

When  $C = 1$

$$\log (C/t) = -\log t$$

$$(8) \quad -\log t = -5.6 + 1040$$

Likewise, for carvone at unit molar concentration,

$$-\log t = -5.3 + 250$$

Letting  $r$  represent carvone and  $s$  thymol and then substituting in (7)

$$\frac{V_r}{V_s} = \frac{-5.3 + 250}{-5.6 + 1040} = \frac{0.236}{1.000}$$

If the constant  $A$  is dropped

$$\frac{V_r}{V_s} = \frac{250}{1040} = \frac{0.240}{1.000}$$

The computed values for the slope  $\frac{\Delta \log C/t}{\Delta C}$  and for the molar vermifugal activities as referred to thymol are given collectively in Table II

TABLE II—SHOWING RELATIVE VERMIFUGAL EFFECTIVENESS

Compound	$\frac{\Delta \log C/t}{\Delta C}$	Molar Vermifugal Activity Referred to Thymol
Thymol	1040	1.00
Pulegone	415	0.40
Carvone	250	0.24

### SUMMARY AND CONCLUSIONS

1 A method, employing the intact earthworm (*Lumbricus terrestris*) as test animal, by which the criterion of molecular toxicity is based upon the rate of change of apparent speed of fatality with change in molar concentration has been developed

2 The fatality- or survival-time corresponding to a given concentration, as determined by this method, is noted as the minimum time of immersion in an aqueous solution of the test substance which will prevent recovery of two out of three worms in 18 hours

3 The toxicities of thymol, carvone and pulegone have been determined by this biological method

The authors express their indebtedness to Dr. E. G. Vanden Bosche and Dr. M. R. Thompson, both of the University of Maryland, for helpful suggestions during the course of the work.

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## THE EFFECTIVENESS OF THEEOL BY ORAL ADMINISTRATION \*

BY L W ROWE AND A E SIMOND <sup>1</sup>

Since the isolation of two crystalline estrogenic hormones, Theelin or keto-hydroxyestrin,  $C_{18}H_{22}O_2$ , and Theelol or trihydroxyestrin,  $C_{18}H_{24}O_3$  (Doisy and collaborators, 1, 2, 3, 4, 5 and Marrian, 6, 7) and particularly since the establishment of an International Standard for the control of potency of such substances, a certain amount of disagreement exists as to their relative potencies

Prior to the adoption of the International Estrogenic Standard at the London Conference of 1932 with the arbitrary agreement that 1 mg of this standard should be equivalent in estrogenic activity to 10,000 International Units, the literature showed many conflicting statements by different workers as to the relation between the rat unit and the mouse unit and similarly between the potency of Theelin and Theelol. Thus Curtis and Doisy (5) and also Marrian (7) found that in aqueous solution and by hypodermic administration Theelin was just about twice as active as Theelol. Butenandt (8) found that in oily solution Theelin was 5.3 times as potent as Theelol. Burn and Elphick (9) on the other hand found Theelin to be only 85% as active as Theelol when compared in aqueous solutions in four injections but in oil solution with a single injection Theelin was found to be 4.5 times as potent as Theelol. These workers do not agree at all with Curtis and Doisy or with Marrian but they do agree very well with Butenandt.

Even greater discrepancies exist in the literature as to the relation between the estrogenic rat unit and mouse unit. Although we are not particularly concerned with this phase of the subject in this short paper, for convenience we will summarize the various findings as follows. Laquer and de Jongh (10) using aqueous solutions and dividing the dose into six injections found the rat unit to be four times as great as the mouse unit and the ratio therefore to be 4 to 1. Kochmann (11) for aqueous solutions found the ratio to be 4 to 1 and for oily solutions to be 2 to 1. Marrian working in conjunction with Dickens and Dodds (12), using an aqueous solution and both four and six injections found the ratio to be 10 to 1. Coward and Burn (13), Becker, Mellish, D'Amour and Gustavson (14) and Burn and Elphick (9) all find the ratio to be 1 to 1 if oily solutions are used in a single injection method.

### EXPERIMENTAL WORK

In the series of tests about to be described, the general method of Allen and Doisy (15) and the suggestions of Kahnt and Doisy (16) were followed except that doses were given orally instead of subcutaneously. That is, the oral dose was divided into three parts given at intervals of about four hours to sensitized rats and

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of 20 rats used at a particular dosage level, about 75 per cent must react positively in order to consider that a positive test

Many comparisons of Theelin and Theelol by subcutaneous injection in our laboratory have rather definitely established the fact that Theelin is three times as potent as Theelol when each is administered hypodermically to spayed rats, since pure Theelin is found to test from 2500 to 3000 Doisy rat units per mg while pure Theelol tests 750 to 1000 rat units per mg

A number of hypodermic tests of the International Standard after it became available, have shown it to contain from 2500 to 3000 Doisy rat units per mg. Other laboratories have assigned different experimental values to this standard of reference so that there is absolutely no uniformity between the International Unit and the Rat Unit as stated by various authorities. For instance Hinglais and Hinglais (17) using an oil solution of the International Standard, divided into three hypodermic doses find that one Doisy rat unit is equivalent to 25 or 30 International Units rather than the usual 3 or 4 which we have found experimentally

#### ORAL ESTROGENIC TESTS (ADULT RATS)

The following series of oral tests were made in the early months of 1935 with Theelin of high potency (2500 and 3000 R U per mg) derived solely from mare's urine of pregnancy which is known to contain no Theelol, and with Theelol of high purity

TABLE I

Dose	No of Rats	Positive	Typical
6 R U (subcu) in 3 oral doses	10	0	0%
8 " " 3 "	10	0	0%
10 " " 3 "	10	4	40%
15 " " 3 "	18	13	72%
15 " " 3 " "	20	14	70%
15 " " 3 " "	20	13	65%
20 " " 3 " "	20	16	80%

At 15 R U (subcu) 40 out of 58 were positive = 70%

With Theelol, R 869366 which assayed 1000 R U per mg hypodermically the following oral tests were made

TABLE II

Dose	No of Rats	Positive	Typical
2 0 R U (subcu) in 3 oral doses	10	5	50%
2 0 " " 3 "	20	12	60%
2 5 " " 3 " "	17	9	53%
2 5 " " 3 " "	20	10	50%
2 5 " " 3 " "	20	11	55%
3 0 " " 3 " "	10	9	90%
3 0 " " 3 " "	20	16	80%

At 2 5 R U (subcu) 30 out of 57 were positive = 52%

At 3 0 R U (subcu) 25 out of 30 were positive = 83%

From these recent tests on highly purified Theelin and Theelol where the relation by hypodermic test is about 3 to 1 (3000 R U per mg for Theelin and 1000 R U per mg for Theelol) the nearest basis of comparison by oral dosage is 15 R U (subcutaneous) of Theelin is equivalent to 3 R U (subcutaneous) of Theelol or that five times as much Theelin is necessary when given orally as would be necessary of Theelol to produce the same effect physiologically. Thus a prod

uct containing only Theelol and standardized hypodermically to 200 International Units per capsule would be just as effective *orally* as one containing only Theelin which was standardized hypodermically to 1000 International Units per tablet

#### ORAL ESTROGENIC TESTS (IMMATURE RATS)

The effect of the various estrogenic principles when administered orally to *immature* female rats (30 days old) has been studied experimentally in order to determine which is most rapid and effective in bringing about sexual maturity as evidenced by opening of the vagina (18)

TABLE III

Product	Dose Hypodermic Units Given orally in 3 doses at 4 hour intervals	Results
International Std (Oil Solution)	30 R U (100 Int U)	2 out of 10 rats, vagina open on the 4th day All open on the 5th day
Theelin R 878216 (Oil Solution)	15 R U	2 out of 10 rats vagina open on the 5th day All open on the 6th day
Benzoic acid ester of Dihydro Theelin (Oil Solution)	30 R U	5 out of 10 rats vagina open on the 3rd day All open on the 4th day
	15 R U	5 out of 10 rats vagina open on the 3rd day All open on the 6th day
Dihydro Theelin (Oil Solution)	15 R U	3 out of 15 rats vagina open on the 3rd day All open on the 7th day
(Aqueous Solution)	15 R U	2 out of 10 rats, vagina open on the 4th day All open on the 6th day
Theelol (Aqueous Solution)	5 R U	2 out of 10 rats vagina open on the 5th day All open on the 12th day
(Oil Solution)	15 R U	8 out of 15 rats vagina open on the 4th day All open on the 6th day

Since control rats in our colony reach sexual maturity normally at about 55 days of age on the average, *i. e.*, 28 days after the above tests were begun, it is seen that large doses of all these estrogenic principles (15 hypodermic rat units given orally in 3 doses) complete this process in 4 to 7 days or less than one-fourth of the normal time

#### OIL SOLUTIONS VERSUS AQUEOUS SOLUTIONS

The increasing popularity of oil solutions of Theelin for clinical use intramuscularly, due to the large single doses that can be given with gradual absorption and utilization, has influenced us to report experimental data, both oral and hypodermic, concerning the action of oil preparations upon test animals

In testing Theelin in Oil by hypodermic administration we find that a single injection is just as effective as when the dose is divided into three parts and injected at four-hour intervals. However, it is impossible to demonstrate experimentally all the activity which is known to be present in an oil solution. That is, if a previously tested lot of crystalline Theelin is accurately dissolved in oil so as to contain 100 rat units per cc. only 75 per cent or 80 per cent of this amount can be found by a careful test of the oil solution due to the reduced rate of absorption of the Theelin from the oil. Thus when the International Standard is dissolved

in oil to contain 1000 international units per cc and tested at that level, only 30 per cent of the rats showed typical estrus instead of the necessary 75 per cent to make a positive test. When tested at the 800-rat unit level, 70 per cent showed typical estrus which practically met the 75 per cent requirement.

When administered orally to spayed rats the several estrogenic principles were relatively less effective *in oil solution* than in aqueous solution. The following table shows this conclusively.

TABLE IV —OIL SOLUTIONS HYPODERMIC VERSUS ORAL ADMINISTRATION

Product (In Oil Orally)	Dose Orally in Hypodermic Units	Result	
International Std	15 R U	Much less than 1 oral unit	
	30 R U	Less than 1 oral unit	30% typical
	60 R U	More than 1 oral unit	90% ' "
	50 R U	More than 1 oral unit	90% ' "
	40 R U	Equal to 1 oral unit	80% ' "
Theelin No 877432 No 878216	15 R U	Less than 1 oral unit	About 30% typical
	50 R U	More than 1 oral unit	90% typical
	40 R U	Equal to 1 oral unit	80%
Benzoic acid ester of Dihydro Theelin	15 R U	Less than 1 oral unit	No effect
	30 R U	Less than 1 oral unit	10% typical
	33 R U	Less than 1 oral unit	20%
	60 R U	Less than 1 oral unit	30%
	50 R U	Less than 1 oral unit	40%
	75 R U	More than 1 oral unit	90% ' "
Dihydro Theelin	25 R U	Less than 1 oral unit	About 20% typical
	50 R U	Less than 1 oral unit	About 20%
	75 R U	More than 1 oral unit	About 90% " "
Theelol	5 R U	Less than 1 oral unit	40% typical
	10 R U	Equal to 1 oral unit	80%

From this data it is seen that 40 hypodermic rat units of Theelin given orally in oil solution are necessary to equal 1 oral unit as contrasted with 15 to 1 for aqueous solutions. With Theelol about 10 hypodermic rat units are necessary while with Dihydro Theelin and its benzoic acid ester about 60 to 75 rat units are necessary to equal 1 oral unit.

## SUMMARY

(1) The adoption of the International Standard and Unit as a standard of reference has not resulted in uniformity or agreement among various authorities as to the relation between the International Unit and the experimental rat unit.

(2) Using Theelin derived from mare's urine of pregnancy and using a pure Theelol from human urine, the relationship between the two by oral dosage was experimentally established at a ratio of 5 to 1, in other words, five hypodermic units of Theelin are required to produce an effect equivalent to that of one hypodermic unit of Theelol.

(3) All the estrogenic principles when given orally to immature rats in doses comparable to those necessary to produce estrus in adult rats by oral administration, will bring about sexual maturity in less than one-fourth the time required normally.

(4) On the basis of animal experiments Theelol appears to be the ideal estrogenic principle for oral use

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#### THE BACTERICIDAL AND BACTERIOSTATIC VALUE OF COLLOIDAL CADMIUM PROTEINATE \*

BY W A LOTT AND W G CHRISTIANSEN <sup>1</sup>

It has been known for many years that various colloidal silver compounds exert considerable bacteriostatic action and some bacteriocidal action. In more recent years a large number of other heavy metal compounds have been prepared in the colloidal state and found to be somewhat active in these respects. Notable among these were compounds of mercury and copper. Cooper and Nicholas, *J Soc Chem Ind*, 49, 386T (1930), called attention to the fact that cadmium acetate was germicidal in a dilution of 1/70,000. Since in the cases of silver and mercury, at least, the germicidal action exerted by soluble ionizable salts of the metals is partially retained by colloidal dispersions of otherwise insoluble salts of these metals, it was considered reasonable to expect high bacteriostatic activity and some bacteriocidal activity on the part of colloidal cadmium proteinate. In order to evaluate it for such activity we prepared a reversible colloidal cadmium proteinate, which contained 5.32% cadmium. This preparation was a very satisfactory stable colloidal solution, which after vacuum desiccation, was slowly but completely reversible. It had no bacteriocidal action and only very feeble bacteriostatic action.

#### EXPERIMENTAL

Eighty-five grams of gelatin were hydrolyzed by refluxing for one hour in 300 cc of water containing 6.8 Gm of 48% potassium hydroxide. Upon cooling, this

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solution of hydrolyzed gelatin was filtered with the assistance of a few grams of Kieselguhr. To this solution was added dropwise, a solution of 11.8 Gm of cadmium nitrate dissolved in 50 cc of water, with vigorous mechanical agitation. The resulting colloidal cadmium proteinate was desiccated, whereupon 58 Gm of dry powder containing 5.32% cadmium was obtained.

Even in 4% solution this colloidal cadmium proteinate had no germicidal activity against *Bacillus typhosus* or *Staphylococcus aureus*. The growth of *Bacillus typhosus* was restrained in dilutions of 1/1000 but not by 1/1500. The growth of *Staphylococcus aureus* was restrained in dilutions of 1/300 but not by 1/400.

We gratefully acknowledge the assistance of our Biological Research Laboratories in determining the germicidal activity of this preparation.

### A VITAMIN E UNIT \*

BY A. J. PACINI<sup>1</sup> AND D. R. LINN

In the case of vitamin E it seems desirable to express the findings in the unit which shall be somewhat comparable to the units adopted by the U. S. Pharmacopœia for vitamins A and D. This is not now the case with numerous reports that have come to our attention concerning an evaluation of the vitamin E potency of a given product, particularly wheat germ oil.

Essentially, it is attempted to discover the amount of product, say wheat germ oil, that must be fed daily throughout the period of gestation to insure a litter of rats from a mother known to have been vitamin E depleted. Not unusually the total number of milligrams of test product required throughout the period, for example, 525, is used to express the vitamin E content of the oil, a 525-milligram oil. Others prefer to indicate the number of milligrams fed daily, a 25-milligram oil.

Unfortunately, these methods of expression are not alone confusing one with the other, but are contrary to the expression of vitamin A and D units in the sense that a "400-milligram oil" contains considerably more vitamin E than a "600 milligram oil," thus giving rise to the awkward interpretation of a more potent oil showing a lower numerical value. Since vitamin E threatens to become as popular in pharmacologic usefulness as vitamins A and D, it seems to us desirable to adopt a method for reporting vitamin E units that would be constant with that used by the Pharmacopœia in the cases of A and D.

The details of the method for determining vitamin E will be the subject of a separate contribution and are centered largely around the original methods proposed by Evans, Bishop and Burr. When 25 milligrams of cold pressed wheat germ oil are required daily throughout the period of gestation to insure a litter of rats in a mother definitely known to have been vitamin E depleted, we prefer to describe this as a 40-E oil. The figure is arrived at merely by dividing 1000, the number of milligrams in a gram, by 25, the number of milligrams of the test product required daily to perform biologically, and thus, the expression "40 units per gram" is in keeping with the expression "600 units per gram" of vitamin A, or "85 units per gram" of vitamin D. Of course, this method of expression agrees more

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closely with the vitamin A than with the vitamin D expression in the Pharmacopœia. In the Pharmacopœia the basis of calculation for vitamin A is the daily dose in milligrams, whereas in the case of vitamin D it is the combined dose fed over a period of eight days.

Any wheat germ oil that has been reported upon by the method heretofore employed by Evans and his co-workers can be re-expressed in terms of the unit herein proposed by the simple arithmetical expedient of converting the value to the number of units per gram.

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### COMPARISON OF NESSLER'S REAGENT TEST WITH OTHER TESTS FOR ALDEHYDES IN ETHER \*

BY F. N. VAN DERIPE, E. C. BILLHEIMER AND F. W. NITARDY <sup>1</sup>

The purpose of this investigation was to determine the comparative value of the U. S. P. Nessler's reagent test, the pyrogallol and fuchsin sulphurous acid reagent test<sup>2</sup> and the ammoniacal silver nitrate reagent test for aldehydes in ether. The comparative sensitivity of these reagents to aldehyde, as well as to other impurities which may be present in ether, such as unsaturated compounds, and also their sensitivity to alcohol in ether, was determined. For this purpose there was prepared a highly purified ether, entirely free from alcohol, aldehydes, peroxides and unsaturated compounds, from which was then made a series of samples of ether containing varying amounts of these ingredients with the exception of peroxides. These specially prepared samples of known composition were then tested for aldehyde content with the three reagents mentioned, at the same time observing the effect of ingredients other than aldehyde upon the sensitivity of the test.

The highly purified ether which was used in this investigation was made as follows:

*Removal of Unsaturated Compounds*—Resublimed iodine crystals were added to freshly prepared pure anesthetic ether and the mixture allowed to stand for five days. Potassium hydroxide pellets were then added and the flask rotated until the ether was decolorized. The ether was then poured off the residual layer and distilled, collecting only the middle fraction, which was found to be free from unsaturated compounds.

*Removal of Alcohol*—This ether was then shaken repeatedly with separate portions of purified distilled water in order to extract the alcohol. It was then shaken with two separate portions of a dilute alkaline permanganate solution, the ether then separated, and dried over fused calcium chloride.

*Removal of Water*—The ether was allowed to stand over sodium amalgam, then poured off and distilled, collecting only the middle fraction.

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\* Scientific Section, A. P. H. A., Portland meeting, 1936.

<sup>1</sup> Chemical and Pharmaceutical Laboratories, E. R. Squibb & Sons, Brooklyn, N. Y.

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Specific gravity measurements on this ether indicated that alcohol removal and dehydration were practically complete. The Nessler's reagent test, as well as quantitative tests for aldehyde and peroxide content, which are capable of detecting at least  $\frac{1}{2}$  part per million of these impurities, gave negative results when applied to this ether. A negative test for unsaturated compounds was also obtained, indicating the product to be absolutely pure anhydrous ether, free from alcohol, aldehydes, peroxides and unsaturated compounds. This ether was now adjusted with purified redistilled water to its original water content of 0.5%, and the preparation of the samples for test by the three aldehyde reagents was begun.

*Comparative Sensitivity of Reagents to Aldehyde in Alcohol-Free Ether*—Using the purified ether, which contained 0.5% water, a sample was prepared for test which contained 1 part per million of acetaldehyde. The three reagents gave the following results:

U S P Nessler's reagent	Immediate haze
Pyrogallol and fuchsine sulphurous acid reagent	1 part per million of acetaldehyde
Ammoniacal silver nitrate reagent	No appreciable effect—no different from blank

The results indicate that both the pyrogallol and fuchsine sulphurous acid reagent and Nessler's reagent are sensitive to this amount of aldehyde, but the former reagent gives a quantitative determination. The ammoniacal silver nitrate reagent is not satisfactory.

*Comparative Sensitivity of Reagents to Alcohol in Aldehyde-Free Ether*—A series of three samples was prepared from the purified ether containing 0.5% water, which samples contained 0.5%, 1.0% and 1.25%, respectively, of alcohol. The alcohol was purified by treatment with saturated sodium sulphite solution, by separation and distillation, collecting only the middle fraction. This alcohol gave a negative test for aldehydes. The samples of ether containing it were tested by the three reagents, with the following results:

	0.5% Alc	1.0% Alc	1.25% Alc
U S P Nessler's reagent	Immediate haze	Immediate haze	Immediate haze
Pyrogallol and fuchsine sulphurous acid reagent	Negative	Negative	Negative
Ammoniacal silver nitrate reagent		No appreciable effect	

It is evident that the pyrogallol and fuchsine sulphurous acid reagent is not affected by alcohol, but that the Nessler's reagent is, as it gave an immediate positive test in the presence of alcohol and the absence of aldehyde. This was difficult to understand, as tests on the three individual components of the mixture, namely, the ether, alcohol and water, had all been negative by the Nessler's reagent test. The tests were therefore repeated on the individual components, and were again found to be negative. On preparing a fresh sample of the ether containing the alcohol and water, however, an immediate positive test with Nessler's reagent was obtained, again confirming the original results. It is apparent that a mixture of alcohol with ether in the absence of aldehyde produces a positive test with Nessler's reagent, from which it must be concluded that this reagent is not specific for aldehyde since it is affected by the alcohol content of ether. The ammoniacal silver nitrate reagent was found to give no reaction to alcohol in ether.

*Comparative Sensitivity of Reagents to Unsaturated Compounds in Alcohol- and Aldehyde-Free Ether*—A sample of the purified ether containing 0.5% water, to which had been added allyl alcohol to a final concentration of 50 parts per million, was used to test the sensitivity of the reagents to unsaturated compounds. Ethylene was found unsatisfactory as an example of an unsaturated compound in place of allyl alcohol for this purpose, as its presence could not be detected by any of the reagents. The following results were obtained on the sample of ether containing allyl alcohol:

U S P Nessler's reagent	No difference between the sample and a blank containing no unsaturated compounds
Pyrogallol and fuchsine sulphurous acid reagent	Negative
Ammoniacal silver nitrate reagent	Same as blank

Apparently none of the aldehyde reagents is affected by the presence of unsaturated compounds in ether.

#### CONCLUSIONS

- (1) Both the U S P Nessler's reagent and the pyrogallol and fuchsine sulphurous acid reagent are sensitive to small amounts of aldehyde in ether, as low as 1 part per million.
- (2) The Nessler's reagent is sensitive to a solution of alcohol in ether as low as 0.5% alcohol and gives a positive test, even though aldehydes are absent. The pyrogallol and fuchsine sulphurous acid reagent is sensitive only to aldehydes, as it is not affected by the presence of alcohol.
- (3) The sensitivity of Nessler's reagent and pyrogallol and fuchsine sulphurous acid reagent is not affected by the presence of unsaturated compounds in the ether.
- (4) Ammoniacal silver nitrate reagent is unsatisfactory for the detection of small amounts of aldehydes in ether.

#### A MODIFIED NESSLER'S REAGENT TEST FOR ALDEHYDES IN ETHER \*

BY F. N. VAN DERIPE, E. C. BILLHEIMER AND F. W. NITARDY<sup>1</sup>

The U S P test for aldehydes in ether has not proven entirely satisfactory because it is not sufficiently sensitive to small amounts of this impurity. The test will show the presence of 50 to 100 parts per million of aldehydes in ether, and can be made more sensitive by using solid potassium hydroxide instead of the solution which is specified by the U S P X, but it is of no value in testing ether which contains considerably less aldehyde, such as 5 to 10 parts per million. A simple Nessler's reagent test will detect the presence of as little as 5 parts per million of aldehyde in ether, but it is also sensitive to alcohol which is present in U S P ether, and is therefore unsatisfactory as an aldehyde reagent. An investigation was therefore made to determine how the Nessler's reagent test could be modified, not only so that the reagent would not be sensitive to alcohol, but also so that it could be used to determine quantitatively differences of 2 or 3 parts per million of aldehydes in ether containing as little as 5 to 10 parts per million.

\* Scientific Section, A. P. H. A., Portland meeting 1936.

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Many variations of the Nessler's reagent itself, as well as the conditions under which the test is conducted, were made and their effect upon the sensitivity of the test studied. The proportion of potassium hydroxide to saturated mercury bichloride solution in the reagent was varied but it was found that this change produced no improvement over the Nessler's reagent of standard composition. In fact, the sensitivity of the test was somewhat reduced by the change in composition of the reagent. It was then determined that by diluting the Nessler's reagent with water and varying the proportions of water and Nessler's reagent to ether in the test, the length of time required for a positive test to be obtained was slightly increased, but a distinction could be made between ethers differing in aldehyde content by only a few parts per million. An extension of this line of investigation eventually led to the development of a modified Nessler's reagent test having the sensitivity desired.

It was found that when the Nessler's reagent is diluted with sufficient water before adding to the test sample of ether, the time required for development of the haze indicating the presence of aldehydes is extended and that caused by alcohol still more so, allowing the necessary differentiation, and at the same time it is possible to distinguish differences of a few parts per million of aldehyde in the ether when the total content is not more than 5 to 10 parts per million. The haze develops in the aqueous layer which separates when the solution is allowed to stand undisturbed after the initial shaking. With the amount of water required to dilute the Nessler's reagent, however, difficulty is encountered in securing separation of the emulsion formed during shaking within the time limit necessary for the observation of the results of the test. This was overcome by substituting a saturated sodium chloride solution for the water. Other salts such as sodium sulphate, potassium sulphate and magnesium sulphate, also sucrose and glycerin, were tried, but all found unacceptable because of development of turbidity or color in the absence of aldehydes. Sodium chloride, however, caused rapid separation of the layers and produced a clear, aqueous layer after the shaking period, permitting satisfactory observation of the result of the test at the required time.

Extensive studies were made on the effect of variation in proportion of Nessler's reagent to saturated sodium chloride solution upon the sensitivity of the test and the time required for the haze indicating the presence of aldehydes to develop, in order to find the combination which would give the most satisfactory results. Increasing the amount of saturated sodium chloride solution in proportion to Nessler's reagent retards the development of haze, and if too large a quantity is used prevents distinction between ethers differing in aldehyde content by only a few parts per million. It was eventually found, however, that optimum results were obtained by diluting 1 cc of U S P Nessler test solution with 17 cc of saturated sodium chloride solution, adding 7 cc of this mixture to 20 cc of ether, shaking for 10 seconds, and then allowing the layers to separate and noting the time required for the first appearance of haze. Best results were obtained when the temperature of the solutions during the test was held at 25° C. Under these conditions results of the following order were obtained, when aldehyde-free U S P anesthetic ether, together with the same ether to which known amounts of aldehyde had been added, were tested.

Aldehyde Content of Ether in P P M	Time in Seconds for Appearance of Haze
0	900
1	305
2	200
3	145
4	110
5	85
6	75
7	65
8	60
10	50

It will be seen that by using this modified Nessler's reagent under the test conditions outlined above, the reaction due to alcohol is eliminated by time, and sensitivity to small amounts of aldehyde in ether is obtained. It is possible to distinguish differences of a few parts per million in aldehyde content by observing the length of time required for the development of haze. Close observation is required when testing ethers containing 0, 1 and 2 parts per million, but with the larger quantities of aldehyde, the development of haze and its increase occurs with much greater rapidity so that it can be more easily detected. Furthermore, when this modified Nessler's reagent is used, the normal alcohol content of anesthetic ether does not result in a positive reaction within one minute, whereas the presence of from 5 to 7 parts per million of aldehyde in such an anesthetic ether containing alcohol produces a positive test in approximately one minute. Hence we suggest the following as a suitable official test for aldehydes in U S P anesthetic ether.

Place 20 cc. of ether in a colorless glass stoppered cylinder and add 7 cc. of a mixture of 1 cc. of alkaline mercuric potassium iodide T S with 17 cc. of a saturated solution of sodium chloride. Stopper the cylinder and shake vigorously for ten seconds then set aside for one minute, the aqueous layer shows no sign of turbidity.

This test we believe has since been accepted for the U S P XI

#### SUMMARY

(1) The U S P X test for aldehydes in ether is not sufficiently sensitive to small amounts of this impurity. The simple Nessler's reagent test is considerably more sensitive, but produces a positive reaction in the presence of alcohol when aldehydes are absent, and is therefore unsatisfactory as an aldehyde reagent.

(2) A modified Nessler's reagent has been developed which is sensitive to 1 part of aldehyde per million in ether and which will not react with the alcohol present in the ether in the time limit required for detection of aldehydes. It is also satisfactory for quantitative estimation of aldehydes in ether containing 10 p p m or less in the hands of a careful worker.

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"A magnificent educational system, an impressive literature, libraries and research institutions, and a highly efficient manufacturing drug industry are some of the great contributions of pharmacy"—R. L. SWAIN in *Drug Topics*

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## THE F D A TEST FOR ANTISEPTIC VALUE OF LIQUOR ANTISEPTICUS \*

BY ESTHER MEYER AND E. N. GATHERCOAL

### THE CULTURE MEDIUM

According to the directions given in Circular No. 198, published by the United States Department of Agriculture and titled, "United States Food and Drug Administration Methods of Testing Antiseptics and Disinfectants" (1931), the following medium was prepared

Liebig's Beef Extract	5 Gm
Sodium Chloride C P	5 Gm
Peptonum Siccum	10 Gm
(Armour's for disinfectant testing)	
Distilled Water	1000 cc

This mixture is boiled for 20 minutes, made up to original weight (or volume) with distilled water, and adjusted with NaOH to  $p_H$  6.8 using the colorimetric method. It is then filtered through paper, tubed (10 cc to each tube) and the tubes are sterilized at 15 pounds' pressure for 40 minutes.

*Comment*—The medium made according to the above directions is quite cloudy. One batch was clarified by the admixture of talc and then filtered through paper, the resultant broth was clear. It is easier to read the results of the test when clarified broth is used.

### THE TEST ORGANISM

The test organism is transferred daily in this medium for not more than one month. At the end of each month, a fresh transfer is made from the stock culture. The stock culture is carried on agar slants of the same composition as the broth medium, plus 1.5 per cent of *Bacto Agar*, and adjusted to from  $p_H$  7.2 to 7.4. The stock culture is transferred once a month and the test organism is taken from the month-old stock culture. When the test organism has not been transferred daily, it is advisable to make three consecutive daily transfers in broth before using it for testing purposes.

### PHENOL

The phenol used must be U. S. P., and in addition, the congealing point must not be below 40° C. A 5 per cent solution may be used as a stock solution if kept in a relatively cool place in well stoppered, amber-colored bottles protected from the light. This 5 per cent solution should be standardized with decinormal bromine or with sodium bromide and bromate solution.

### PHENOL RESISTANCE OF THE TEST CULTURE

According to the F. D. A. method, developed by G. F. Reddish, the *Staphylococcus aureus* culture should show the following resistance to phenol at 37° C.

Phenol	5 Min	10 Min	15 Min
1-80	+	0	0
1-90	+	+	+

\* Scientific Section A. P. H. A. Portland meeting 1936

Phenol	5 Min	10 Min	15 Min
1-80	+	0	0
1-90	+	+	0

It is not an easy matter to find a culture of suitable phenol resistance and to maintain it so. Four strains were tried including the Food and Drug Administration strain of *Staphylococcus aureus*, known as "A 209." According to our experience, not one strain, including "A 209," really coincides with the required phenol resistance. Upon further experiments with these four strains it was found that there was a day-to-day variation in their resistance to phenol. This may be partially explained by the fact that some broth cultures show very granular growth, while others show a uniform diffused growth. The former are more resistant than the latter, probably due to the fact that the bacteria, when in clumps, are not so easily killed by the antiseptic solutions. Agar petri dishes spread with a drop of the broth culture of granular growth show a large number of "R" colonies while the diffused type of growth yields entirely "S" type colonies. This is not to be considered as a real dissociation, for a transfer made from a tube showing granular growth may give rise to the diffused type of growth. Therefore, the change was only a transient one. Smyth (1934) observed similar growth and says, "When incubated above 36.5 all broth cultures were of the 'R' type, with flocculent turbidity and pellicle in twenty-four hours, while below this temperature the turbidity was uniform." It seems doubtful, however, that this is the only reason, for several different strains which were incubated under exactly the same conditions did not all yield granular growth.

Others working with *Staphylococcus aureus* have experienced this day-to-day variation in the same culture, and Cohen (1922) found a probable error of 2 or 3 per cent under the most ideal conditions, and as high as 10 per cent in most of his work. Smyth (1934) published the results of his detailed experiments on factors influencing the phenol resistance of *Staphylococcus aureus*, and concluded that any small deviation, such as concentration of disinfectant and of cells, the temperature at which the disinfection test is conducted, the age of the culture and even a 1° difference in the incubator temperature, will cause variations.

The following are the four charts showing the phenol resistance of tested cultures

#### STAPHYLOCOCCUS AUREUS (CORDELL STRAIN)

Phenol	5 Min	10 Min	15 Min
1-80	—	—	—
1-90	+	+	—

#### STAPHYLOCOCCUS AUREUS (AMER. TYPE CULTURE COLLECTION No. 4691)

Phenol	5 Min	10 Min	15 Min
1-80	—	—	—
1-90	+	—	—

#### STAPHYLOCOCCUS AUREUS (AMER. TYPE CULTURE COLLECTION No. 4776)

Phenol	5 Min	10 Min	15 Min
1-80	—	—	—
1-90	+	+	+

## STAPHYLOCOCCUS AUREUS (U S DEPARTMENT OF AGRICULTURE A 209)

Phenol	5 Min	10 Min	15 Min
1-80	—	—	—
1-90	+	+	—

Dr Leila Jackson, the assistant curator of the American Type Culture Collection, in a personal communication to the author, said that difficulty was experienced in keeping *Staphylococcus aureus* cultures to the required standard for use in phenol coefficient testing. A culture may be suitable at one time and not at another time and complaints from clients regarding this matter were frequently received.

Because of the foregoing facts, standards, as to the phenol resistance of the organism, in the test for antiseptic value to be included in the National Formulary have been established as follows:

Phenol	10 Min
1-80	—
1-90	+

## LIQUOR ANTISEPTICUS, N F VI

Three antiseptic solutions were prepared according to the following formulas:

	Solution A	Solution B	Solution C
Boric acid	25.0 Gm	25.0 Gm	25.0 Gm
Thymol	1.0 Gm	0.75 Gm	0.5 Gm
Chlorothymol	1.0 Gm	0.75 Gm	0.5 Gm
Menthol	1.0 Gm	1.0 Gm	1.0 Gm
Eucalyptol	2.0 cc	2.0 cc	2.0 cc
Methyl salicylate	1.0 cc	1.2 cc	1.2 cc
Oil of thyme	0.3 cc	0.3 cc	0.3 cc
Alcohol	300.0 cc	300.0 cc	300.0 cc
Distilled water g s	1000.0 cc	1000.0 cc	1000.0 cc

## TECHNIQUE

A 24-hour culture of *Staphylococcus aureus* No. 4776 was used in testing the antiseptic solutions at 37° C. 0.5 cc of the culture was added to 5 cc of the antiseptic solution, at 5-minute, 10-minute and 15-minute intervals, one loopful was transferred to sterile broth tubes, the tubes were incubated for 48 hours at 37° C., and readings taken.

The following charts show the results obtained:

Antiseptic Solution (A)	5 Min	10 Min	15 Min
Trial 1	—	—	—
Trial 2	—	—	—

*Comment*—Liquor Antisepticus (A) also killed the test organism at 1-, 2- and 3-minute intervals.

Antiseptic Solution (B)	5 Min	10 Min	15 Min
Trial 1	+	—	—
Trial 2	—	—	—

Antiseptic Solution (C)	5 Min	10 Min	15 Min
Trial 1	+	—	—
Trial 2	+	—	—

Solution A has been approved as the official Liquor Antisepticus

*Comment*—To further substantiate the antiseptic value of Solution A, the other three strains of *Staphylococcus aureus*, mentioned previously in this paper, were used as test organisms and in each case the 5-minute, 10-minute and 15-minute tubes were sterile. This would further indicate that the phenol resistance of the organism need not necessarily be so stringently standardized, unless extremely careful research work be the objective.

As a matter of interest, the following preparations were tested for their antiseptic powers

(1) Surgical solution of chlorinated soda assaying 0.48 per cent of NaOCl and 0.46 per cent available chlorine, killed *Staphylococcus aureus* at 5 minute, 10 minute and 15 minute intervals

(2) Alcohol (35 per cent) did not kill *Staphylococcus aureus* in 5 minute, 10 minute or 15 minute intervals

(3) Silver Nucleinate (*Argento-Protesinum Mite U S P*) 10 per cent solution exhibited only bacteriostatic action in 5 minute, 10 minute and 15 minute intervals

(4) Silver Nucleinate (*Argento-Protesinum Mite U S P*) 20 per cent solution killed *Staphylococcus aureus* in 5 minute, 10 minute and 15 minute intervals

(5) Hydrogen Peroxide (*U S P*) did not kill *Staphylococcus aureus* in 5 minute and 10 minute intervals but did in 15 minutes

(6) "Pepsodent Antiseptic" killed *Staphylococcus aureus* in 5 minute, 10 minute and 15 minute intervals

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## OINTMENTS \*

BY RALPH W. CLARK <sup>1</sup>

Lee and DeKay (1) in discussing an ointment base for official ointments say, "The criticisms of the official ointments are in a large measure traceable to their bases. The usual story about them is that they become rancid or grainy or are too stiff or too soft. An ideal ointment base, is, of course, a pharmaceutical dream that has never come true and perhaps never will." They propose a simple base composed of white wax and anhydrous wool fat, of each 5 per cent and 90 per cent of white petrolatum for use in a general way as an ointment base.

\* Section on Practical Pharmacy and Dispensing. A. PH. A., Portland meeting 1935

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During the past few years research has been conducted which indicates that the old classification of ointment bases, *i. e.*, epidermatic, and endermatic and dermatologic or systemic, making use of petrolatum, lard, also vegetable fats and wool fat, respectively, as typical bases, is possibly due for some change. It also becomes apparent that each medicated ointment must be subjected to series of pharmacological tests before the best base may be used to secure the desired results. The first thing to be considered is whether an ointment is wanted which will be absorbed through the skin or by the skin.

Sollmann (2) points out that the chief reasons for the use of wool fat are its advantage of forming salve-like emulsions and its adhesiveness. For a protective layer petrolatum may suffice. He suggests the use of lard when the ointment is to be rubbed in by friction. This is a statement which points in the direction indicated by recent extensive work in this country and abroad. The absorption of substances through the skin varies greatly. The behavior of medicinal agents to be used even before they are incorporated in the ointment base is desirable as well as a study of the finished product. Gershenfeld and Miller (3) report on the varying bactericidal efficiency of 2 per cent phenol ointments and recommend water miscible vanishing cream formulas as bases for this and other bactericidal agents.

Some substances are absorbed readily, for instance, Vitamin D. Amrhein (4) has shown that Vitamin D can be absorbed from the skin, the vehicle apparently having little or no effect in the absorption test since the vitamin was absorbed from both vegetable and mineral bases. It was demonstrated that cosmetic creams could also be used for carrying vitamin substances.

Brown and Scott (5) found that maximum absorption of methyl salicylate was from a 11.8 volume % suspension in water, the next best from a 50% alcohol solution, and the minimum from the pure ester. On a percentage basis the 50% volume in olive oil and lard oil was 29% better than the pure ester, anhydrous lanolin and petrolatum 26 and 66% better, alcoholic solution 414% better, and the aqueous suspension on this basis is 632% better. Massage increased absorption 34% to 158%. Rise of temperature from 32° to 42° increased absorption from 143° to 175°.

Kahlenberg (6) noted that boric acid was quickly absorbed by the skin from a saturated solution. He found that a dilute hydrochloric or a dilute sulphuric acid solution foot-bath increased the alkali reserve while a citric acid foot-bath increased the acidity of the blood. He could not explain this as when taken internally these substances react in the opposite manner. He concludes that with the latter findings one should not be surprised to find boric acid acting in a different manner when applied externally in an aqueous solution as compared to being taken internally or applied as the solution of one of its salts. In a later work Kahlenberg (7) found that boric acid passes into the urine in 50-55 seconds when the feet are immersed in a saturated solution at 45 degrees.

This obviously represents the circulation time plus the time of absorption and secretion. The real time is probably somewhat less than that actually noted for the observation depends on the sensitiveness of the test. Possibly if larger samples of urine had been taken earlier than 50 seconds and their residues tested indication of the presence of boric acid might have been obtained even a little sooner. Physiologists have estimated the circulation time in man at about 20

to 30 seconds, the results, of course being only approximate for in such experiments different paths are open to the blood in completing the circuit "

In a short discussion of the resorption of pharmaceuticals through the skin, Liesegang (8) points out that the work of Whitehouse and Ramage (9) contradicts that of Brown and Scott (10)

Whitehouse and Ramage have shown previously that the human skin is permeable to water, under physiological control, partially regulating body temperature, yet salts and colloidal substances do not appear to diffuse through the epidermis, so that in this respect it seems to play the part of a semi-permeable membrane Upon immersing the arm in solutions of varying concentration of (a) lithium chloride (lithium kation) and (b) KI (I-anion) at 75-93° F (to increase circulation of blood in skin and thus facilitate diffusion) no additional lithium (spectroscopic method) or iodine (chemical assay) was found in urine An experiment in which iodine ointment was rubbed on the skin showed a definite increase in the iodine content of the urine after application and indicated that un-ionized iodine is absorbed

Fischler (11) discusses the emulsion types of ointments stating that the water-in-oil class has greater penetrating properties while pure fats and petrolatum lie on the surface

He mentions cholesterol and oxysterol as emulsifying agents for salves as well as certain patented emulsifiers

Poethke (12) discusses the theory of emulsification, a sub-division of which is the water-containing salves He adds Euzerit, a patented unsaturated alcohol isolated from wool fat as an emulsifying agent A mixture of 5 per cent of Euzerit with paraffin ointment is the product known as Eucerin (Aquaphor) He suggests the use of soaps and lecithin for the preparation of oil-in-water ointments He calls water-in-oil ointments cool ointments and the other type covering ointments In addition to the base the nature of the medicinal substance is important

The theories of emulsification are discussed at length by Clayton in his book on the "Theory of Emulsion," 2nd Edition (1928) The writer is informed that this valuable book is at present out of print pending the publication of a new edition Clayton is quoted very frequently by writers discussing the emulsion type of salve, cream or ointment It should also be said that much investigation is being carried on in this field by the cosmetic industry as is noted by looking through *Drug and Cosmetic Industry* and other similar magazines for the last few years

In an earlier work Moncorps (13) found

- 1 The water-combining properties of salves and pastes depend upon the emulsion process used

- 2 Two classes of emulsions are involved in water-containing salves Water in oil as most frequent and oil in water as the least frequent types

- 3 The emulsion type depends in the first place upon the emulsifier and further upon the manner of preparation and the relation of water to fat

- 4 The cooling property does not depend on the amount of water incorporated but upon its possibilities of evaporation The evaporation is aided by oil in water emulsions or coarsely dispersed unstable water in oil emulsions

- 5 One is able, with the aid of emulsifiers to bring fats oil and waxes or any hydrocarbon of the methane series into the desired emulsion form



6 The action of water-in oil emulsion ointments may be a double one—depending on the stability of the emulsion and its method of application—with stable emulsions upon the application of a heavy layer and a sufficiently long period of action can be compared with the action of an impermeable moist dressing. With unstable water oil emulsions under the same conditions the action may be compared to the oil water emulsion and with a moist permeable dressing.

7 Speaking of the various emulsion forms the absorption of the vehicle and the incorporated medicaments depend upon various conditions.

This latter writer (14) in an article entitled "The Resorption and Pharmacodynamics of Salve-Incorporated Salicylic Acid" concludes

1 Findings *in vitro* about the giving off possibilities of different bases for salicylic acid permit no retro conclusions about the processes of adsorption and resorption going on under therapeutical conditions.

2 The extent of salicylic acid adsorption and resorption or as the case may be of keratolysis, depends in addition to the choice of the base, to a great extent, on the way of application.

3 For the dermatological salve bandage there resulted with reference to resorption measured in the progress of the elimination curve in the urine the following gradation: benz lard paste of zinc oxide, vaseline, lanol cum aq (20%) physiol A, physiol B, eucerin cum aq (50%) physiol C. The discharged salicylic acid quantity is proportioned as follows: 1 12 24 38 41 10 15 40. It amounts in a minimum with hog fat to 0.29% and a maximum with physiol C to 11.82% of the applied salicylic acid quantity with 24 hour salve application.

4 In the case of the bases occurring in emulsion form (physiol C—oil in water and eucerin—water-in oil) the keratolytic effect appears. The method of application of the dermatologic salve bandage presumed, in a concentration of from 0.5% to 1% while with lanolin and vaseline the same became manifest at 5% and with hog fat and zinc paste first at 15%.

5 With the rubbing in of salicylic acid salves, only a slight resorption takes place with 5% concentration (5 Gm on 0.16 sq cent of skin). No quantitatively noticeable quantities of salicylic acid in the urine could be proved. The salicylic acid identification is successful first at a concentration of 25%. The salicylic acid speculum in the urine rose with the application of vaseline lanol c aq (20) benz lard, zinc paste physiol C, eucerin c aq. With the application of the last-named base on the average 3.4% of the applied salicylic acid was discharged.

6 The salicylic acid discharge is quantitatively not determinable about six hours after taking off the bandage.

7 The keratolytic action of salve incorporated acid is strengthened when suitable conditions are given favoring the possibility of the swelling of the horny skin, partly in the physico-chemical properties of the salve itself or in the application method.

8 Salicylic acid in aqueous solution in the form of permeable moist bandages is not able to create a keratolysis nor does a stronger resorption take place in contrast to the alcoholic solution.

9 The alkali reserve of the blood is not influenced by the salve incorporated salicylic acid.

The writer does not claim to have covered the field of ointments in this paper. His purpose was to review only a few articles which point to the importance of extensive research on each ointment to find the base best suited to the action desired.

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## A SERVICE THAT BUILT A PRESCRIPTION BUSINESS \*

BY L D BRACKEN

This paper is an attempt to briefly relate the use of an unusual idea in the building or developing of a prescription business

After several years of practical experience in drug stores of the Middlewest the writer entered a pharmacy college on the Pacific Coast, and thereafter a medical college on the Atlantic Coast. He was impressed with the fact that both types of colleges did not teach enough practical therapeutics. The turmoil of the World War interrupted his medical college work, after one and one-half years. He re-entered the drug field in a general store, later, in 1921, he launched into exclusive prescription business. Key locations (medical buildings) were not available, so a location one block from a commercial building housing about forty doctors was chosen as a starting place. A limited amount of capital made necessary a small stock, and the potential prescribers in the above-mentioned building were solicited and asked regarding their likes and dislikes on most popular drug items, brands, etc. The reactions and responses of most of the doctors were encouraging, and the store was duly opened on December 15, 1921.

The writer concluded from experience in school, that lack of practical therapeutics in the curriculum of both medical and pharmacy colleges left a vulnerable spot, and with this thought in mind, it was decided to undertake a direct mail *Bulletin of Information Service* to the doctors.

The first bulletin was typewritten on legal size paper, printed as a letterhead, with a 3" x 4" cut in the lower right-hand corner which read "We invite you to phone Main 2110 for dependable information." The message was addressed to the individual doctor and started with this statement—"Dear Doctor. We offer the following information"—the subject matter was limited to four paragraphs. Each paragraph stated brief information of unusual character about some product in which we thought the doctor would be interested. In this first bulletin we informed the doctors that "Arsenicals were about to be made available through the drug trade." From the first issue of 155 bulletins we received eleven requests for further information regarding "Arsenicals," such as "When will you have it in stock?" "How much will it cost?" "Can you supply literature?" etc. This response was thrilling, and the success of the idea seemed assured. However, it required almost a year before we were justified in really saying it was a success.

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\* Section on Practical Pharmacy and Dispensing, A. P. H. A., Portland meeting, 1935

We discovered immediately that extreme care must be used in making any statements regarding medicinal products, and for that reason we confined ourselves almost exclusively to official products or new and nonofficial items.

The requests for information which finally began to come in are most interesting. For several years a file was kept of the unusual questions, which were recorded as near as possible *in the exact words* in which they were received. A request for the dose of Digitalis or some question comparable, was not recorded, as any pharmacist should be able to furnish this answer, but how many pharmacists could answer this one which came in from a large Hospital? "Send us some serum Bilirubin and tell us the dose," and from a physician—"What antidote besides Sodium Thio sulphate is available for 606 poisoning?", and this from another physician—"What have you to stop uterine bleeding, Ergot has no effect?", and this from a Hospital—"Send us some Tololo Tablets." This was interesting, we saw the patient's chart and the order read "Tololo Tablets." However, careful study showed the order to mean "10-10-10 Tablets." The order had been hurriedly written, the figures run together, and "tololo" was plainly written thereby. This from another physician—"I have a woman patient thirty-two years old with a blood sugar of 70, give her something to increase her blood sugar, she has plenty of sugar intake." This from an M D—"Send me something quick to remove mercurochrome stains from my trouser leg." This from an M D—"Send me some Streptococcic Serum for Cardioarthrides." This from a nurse—"Doctor wants a complete outfit for Arsphenamine with scale for neutralizing according to Stokes." From an M D—"What can I give my wife for a persistent hacking cough, something without narcotic?" This from a large clinic—"Send a course of Urea for Blood Urea test, patient weighs 172 pounds."

These references are a few of a great many requests which have been collected over a period of fourteen years.

Our mailing list now comprises about six hundred names and includes the pharmacists in hospitals and many of our competitors.

During this fourteen-year period we have introduced a number of new products for ethical pharmaceutical houses, this idea is a decided advantage to us and helps the manufacturer in rapidly gaining an entrée for his product. On several occasions we have used our *Bulletin* to condemn fraudulent practices on the part of unscrupulous firms, this has been appreciated by the Medical Profession and we have received many compliments from their Association.

The material used in this service is mostly drawn from ethical, medical and pharmaceutical publications. Manufacturers' reports and literature are also used, if the claims are conservative and the firm has a good reputation. The source of all our information is recorded and is frequently used and loaned to doctors and dentists. We try to publish some propaganda on N F and U S P in each number. We no longer publish prices on office supplies, but we do mention the price on new items.

This bulletin service has cemented a bond of friendship and confidence between the doctors and our store that has more than compensated for the effort and expense involved. Seven registered pharmacists, a bookkeeper, two porters and two motorcycle deliverymen are now employed by the firm and the business has grown to a volume near six figures.

## IS EXTEMPORANEOUS PHARMACY A MORIBUND ART?\*

BY WILLIAM F. REINDOLLAR AND HOWARD E. CHANEY<sup>1</sup>

The increase in competition resulting from a variety of economic causes has driven the retail pharmacist away from the scientific phases of his profession and into an ever-broadening field of merchandising. The development of large pharmaceutical manufacturing houses which offer the galenicals of the United States Pharmacopœia and National Formulary accurately standardized, attractively packaged and reasonably priced, has gone far toward eliminating the preparation of these products in the laboratory of the retail drug store. That this is an unwholesome condition for professional pharmacy is accepted without dispute. It is interesting, however, to consider whether this loss of "pharmaceutical application" has been attended by a corresponding loss of skill, or a waning interest in the practice of pharmacy. Warning notes have already been sounded (1, 2) upon this subject. No one doubts, that with the training he receives, the retail pharmacist is capable of preparing galenicals that will meet the requirements of purity, strength and composition laid down by the Official Standards, but the question often arises: Does he?

It has been the purpose of this investigation to study certain simple pharmaceutical preparations which it is believed were compounded in the retail drug store. To make a proper selection, one that eliminates the "machine made" product, is more difficult than one would perhaps believe. When inquiry was made of the retail pharmacist concerning the source of such simple galenicals as Camphor Liniment, Ointment of Zinc Oxide or Aromatic Spirit of Ammonia, the invariable reply was that they were purchased rather than compounded. Owing to this condition recourse was had to certain unofficial capsules and solutions that are generally prepared extemporaneously. Only three of the pharmacopœial galenicals were included in the study, there being considerable evidence that these were produced by the retail pharmacist.

The types of samples and the number of each group examined appear in columns one and two of the table. An arbitrary limit of ten per cent variation on either side of the official or defined value of the principal ingredient was accepted in every case, except that of Basham's Mixture, where the more generous tolerances of the U. S. P. were employed. The percentage of each group falling below, above and the total beyond the empirical tolerance, together with the extreme variations, are recorded.

Sample	No.	Limits of 10% Tolerance	Below	Percentage Above	Beyond	Extreme Limits
Aspirin Capsules, 5 grs	170	4.5 - 5.5 grs	8.8	24.1	32.9	3.94 - 7.70
Quinine Capsules, 3 grs	54	2.7 - 3.3 grs	29.6	11.1	40.7	1.19 - 3.69
Quinine Capsules, 5 grs	178	4.5 - 5.5 grs	30.3	16.8	47.1	2.75 - 6.70
Diluted Hydrochloric Acid	235	9 - 11 Gm	11.3	36.6	47.9	1.54 - 16.89
Basham's Mixture Ammonia	76	0.6 - 0.8 Gm	9.2	30.3	39.5	0.29 - 0.94
Basham's Mixture Iron	76	0.16 - 0.20 Gm	14.5	29.0	43.5	0.09 - 0.34
Lugol's Solution-Iodine	56	4.5 - 5.5 Gm	21.4	5.4	26.8	2.57 - 5.89
Lugol's Solution-Potassium Iodide	56	9 - 11 Gm	1.8	12.5	14.3	8.78 - 14.06

\* Section on Practical Pharmacy and Dispensing A. Ph. A., Portland meeting

<sup>1</sup> Contribution of Bureau of Chemistry, State of Maryland Department of Health

Sample	No	Limits of 100% Tolerance				Below	Percentage Above	Beyond	Extreme Limits.
Argyrol Solution—10%	5	9	—	11	Gm	40 0	40 0	80 0	8 16- 12 1 <sup>9</sup>
Argyrol Solution—15%	14	13	5	—	16 5 Gm	28 6	21 4	50 0	6 54- 26 12
Potassium Permanganate Solution—1%	51	0	9	—	1 1 Gm	9 8	15 7	25 5	0 30- 1 51
Saturated Solution Potas- sium Iodide	59	90	—	110	Gm	25 4		25 4	55 3 -103 1

*Discussion*—A cursory examination of these results is rather depressing. A substantial percentage of every group falls beyond the ten per cent limits. With the sole exception of the potassium iodide solution, where saturation prevents it, the tolerance is exceeded both in the lower and the upper ranges. While the extreme variations must not be considered too seriously, they serve to show how wide of the mark the pharmacist's effort sometimes falls.

As has been observed before, the percentage of samples containing an excess of active ingredients compares favorably with those that are deficient. This seems to eliminate desire for sophistication as an underlying cause. What then is the explanation of these deplorable data? Can it be that from lack of application the retail pharmacist is losing both the capacity and the desire to practice his profession? Is Extemporaneous Pharmacy a moribund Art?

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### YOUR OPPORTUNITY FOR PUBLICITY \*

BY HOWARD STEPHENSON

An editor, whose trade is occupied with words, is always bound to stand in some trepidation before a body of scientists such as this, because deep in his heart he knows that here are representatives of a class of men and women, alone of all the world's inhabitants, who know more peculiar and strange and awesome words than he has ever included in his ken. Therefore if I have seemed to blink and gulp on more than one occasion, during your sessions, please believe that it was simply in an attempt to swallow and absorb at once the marvelous succession of polysyllables which I have heard issue from the lips of other speakers.

To-day I have not come, however, to deal with words. The AMERICAN PHARMACEUTICAL ASSOCIATION, as the mother organization of all pharmaceutical bodies in this country, is bound to have this year a very deep concern for the economic welfare of the pharmacists of this country, who find themselves faced in many cases with an almost hopeless prospect for the future. If through you I may pass on to them some practical assistance in the operation of the 55,000 retail pharmacies of the country, by putting the weapon of publicity into their hands, that is a service worth the rendering and one to which I shall address my brief remarks.

When we consider pharmacy in relation to publicity, our thoughts naturally

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\* Section on Education and Legislation A PH A Portland meeting 1935

turn at once to the one week of the year, in October, during which the profession of pharmacy is publicized to its advantage on a national scale. In my files are clippings from 800 American newspapers which in 1934 published news and editorials on Pharmacy Week. I believe that this publicity, accorded to the profession at large, is the greatest public recognition it has ever received. This year, we who have publicity plans in hand are hopeful of an even greater response to our efforts.

Many hundreds of drug stores last year entered the national window display contest ably conducted by Dr. Hogstad and his associates during Pharmacy Week. Each of these stores, whether or not its display won a prize, gained public esteem and appreciation of incalculable value.

The efforts in the promotion of pharmacy gardens as public or semi-public institutions is well known to most of you. Yet I will not conceal from you the fact that the pharmacy garden movement has scarcely begun to capitalize on its possibilities. Here is an opportunity and a real one for every local and state pharmaceutical association in the country. Nor should we except the National Institute of Pharmacy in Washington, on whose grounds, I deeply feel, a pharmacy garden should be an important project, a show-sight of the nation's capital, attracting thousands of visitors each year.

Why do I refer to the pharmacy garden as a means of publicity? It is because this type of project is eagerly taken up by important groups in every city, public officials look kindly on it and the newspapers are generous in giving it publicity. It directs and focuses public attention upon the professional aspect of pharmacy and does much to set the pharmacist aside, in the public mind, from other merchants whose businesses may lack the tradition, romance and general interest of your own.

I shall but mention in passing the important project which Frank A. Delgado of the Department of Commerce has set forth in detail at your convention—the possibility of inducing the government to issue a special Pharmacy stamp. This impressive plan, which Mr. Delgado did me the honor of outlining at length in *American Druggist* in the two most recent issues, is practical and worth undertaking. I sincerely hope the ASSOCIATION will receive a report at its 1936 convention that the Pharmacy stamp issue is shortly to become an actuality.

There is no need to labor the point of advantages to be gained by these varied types of publicity. Every pharmacist benefits from each of them. But I do want to impress upon you the fundamental thing which lies behind all such publicity—in order to obtain it, something had to be accomplished, by the profession, which had true merit. That is the principle behind all publicity. It is not a matter of seeking out an editor, or a writer, and asking for a little or a grandiose puff for an individual store, school, organization or association. *First*, get something done which is worth talking about. After that, publicity will be added unto you without any but the most legitimate efforts.

To be specific, let us examine what the retail pharmacists of Birmingham, Alabama, have done this past year. I doubt whether there is a city in the United States where public regard for pharmacy as a profession has risen higher. I want to quote for you from a little leaflet which I understand has been placed, not once but many times, into every home in Birmingham and environs. On the first page appears an emblem with the legend "This Emblem Protects You." On

pages 2 and 3 under the heading "Ethical Pharmacy Shields You" the following statements are made

This slogan adopted by the Birmingham Retail Druggists' Association has a deep meaning for all who patronize the Pharmacist whether it be for the specific purpose of having a prescription filled or for any other reason

Recognizing that Pharmacy is a public service each member of the B. R. D. A. is pledged always to conduct his business in a strictly ethical manner

' To comply with all laws governing the practice of Pharmacy

' To maintain a neat and sanitary store, paying close attention to his Prescription Department

' To keep from his store all objectionable practices and persons

' To hold the health and safety of his patrons as his first consideration

' To compound each prescription entrusted to him with the utmost care, using only drugs or preparations of the highest quality, exactly in accordance with the instructions of the prescribing physician

Never to substitute one drug or preparation for another without first consulting with the prescribing physician

' To refrain from the treatment of diseases but in cases of emergency to render such assistance as he can pending the arrival of the physician

Finally to make a just and reasonable charge for his services being guided by the Golden Rule in all his dealings

The emblem of ethical pharmacy may be found on the window of every member of the Birmingham Retail Druggists Association

Choose your druggist with the same care that you use in selecting your physician

Be safe Look for the emblem first "

And then, on the last page of the leaflet, there appears the name and address of the individual pharmacy which distributes it

I need not have chosen Birmingham for my example In Memphis, the same sort of work is being ably done In Asheville, the retail druggists have carried on a most impressive paid advertising campaign In San Francisco, the local association has done likewise Up in New England, through the intelligent efforts of a firm of wholesale druggists, 90 per cent of retail pharmacies display a sticker, and the clerks wear a celluloid button with the legend "Protect your health Buy your medicines at a registered pharmacy "

The secret behind each of the successful publicity campaigns which I have touched upon is the same—banding together, a group of pharmacists resolved to hold before the public eye the importance of pharmacy to the public They have done it modestly, honestly and effectively They have learned cooperation

Now all this sort of activity is worthy of and has received the greatest approbation When we come to the individual pharmacist, who is likewise entitled to publicity *when he does something to deserve it*, there is lacking the impressiveness of group action Yet month in and month out our reporters discover drug stores in hamlets, towns and cities, which have found legitimate means of gaining publicity as a means of building business

It would be very well if we might say to druggists "Give over all your activities except the filling of prescriptions Go back to ethical pharmacy and have done with the handling of miscellaneous merchandise which has turned your place into an emporium and a general store "

We have, it seems to me, to look upon the business of drug retailing from a

somewhat broader point of view than this How many drug stores could survive if by waving a wand we should actually separate the sheep from the goats and the tares from the wheat? We know perfectly well that economically such a move would ruin three-fourths of them That does not imply by any means that the ethical or professional side of the business should be ignored or slighted Granted the general store aspect of many pharmacies, we can't blink the fact that other lines of business, carried on concurrently under the same roof, provide the only practical way we have yet been able to devise to bring pharmaceutical service to hundreds of communities Therefore in considering publicity for drug stores, it is important that every side of the store's business be used to provide publicity, always remembering that some worth-while idea or accomplishment is a first necessity

The Philadelphia druggist whose claim to public fame lies in the fact that he is an excellent band leader has lost none of his stature as a pharmacist thereby

The druggist in the village of 5000 persons, Princeton, Ill., who equipped his store with air-conditioning units and thereby captured trade from the entire county is not sacrificing anything as a pharmacist

The druggist in Pierre, South Dakota, who transformed his store by putting in a new front and fixtures and telling the whole town about it hasn't lost respectability He has gained it

The druggist in New York City whose window display always includes some pictures of New York of former generations hasn't driven away the physicians and their patients They now have some *interest* in his store as opposed to those of his competitors

The druggist in Fort Morgan, Colorado, who puts on an Easter egg race for children every year and then—are you horrified?—awards ice cream cones to winners right in his pharmacy, has lost no whit of his skill in filling prescriptions

There are 14 druggists in the United States who are mayors of their towns or cities They have not dragged the profession down, but have upraised it

The druggist whose store is the meeting place for the Kiwanis Club is still faithful to his ideals as a pharmacist—more faithful than ever

The druggist in a little town in New York State who has started a new national interest in vocational training, through his *own drug store*, in part—he is better equipped to deal with pharmacy than if he had engaged in no such activity

Every one of these men has gained wide-spread publicity, beyond the confines of his own community Each could be matched with a hundred others, known to the people in his town, respected by them, patronized by them for their strictly pharmaceutical needs—because having done one worth-while thing each capitalized on it, obtained legitimate publicity on it, let people know that here was a man who stands out a little from the crowd

Publicity is a practical means of increasing business and a definite weapon in a competitive age If druggists of to-day need anything, it is not to be told of the evils of merchandising, but it is to be better educated in merchandising practice Given a clean store, an adequate personal preparation for his job, the pharmacist who uses publicity in furtherance of his business *and his profession* has proved himself a leader As such he deserves not only applause, but wide-spread imitation

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## ESTONIAN PHARMACY FORGES AHEAD \*

BY RUDOLF WALLNER <sup>1</sup>

Since 1918, when Estonia won its independence from Russia, thanks to President Wilson's doctrine of self-determination of nations, pharmacists of this country have made a decided advance in the training of young pharmacists, in pharmaceutical administration, in organizing associations and founding pharmaceutical periodicals. The purpose of this paper shall be an attempt to outline briefly on historical background the nature of this advance in Estonian pharmacy.

The first law regulating the practice of pharmacy in Estonia dates from the year 1695, when this country was a part of the Kingdom of Sweden. This law was promulgated by the Council of the State of Tallinn (Reval), which since the Middle Ages, similar to other city-states of the Hanseatic League, was sort of a republic. The law in question was called *The Apothecaries Law and Uniform Scale of Prices* ("Tax") of the Royal Dominion of Reval. From this we learn that the council reserved for itself the right of inspecting the apothecary shops of the dominion, in presence of a physician. The law, however, provided that, in cases wherein the council did not deem its presence necessary, it could delegate the state physician to inspect and superintend the drug stores of the district. Incidentally among his other duties were to see that in Reval only the "physicians authorized by the Highly Commendable Collegio Medio Regio os Stockholm" were practicing, and that no apothecaries, surgeons, bathers and midwives were attempting to practice internal medicine nor were dispensing "purgations, vomitories, especially that of antimony, opiates, 'Mercurium Dulcem Precipitatum,' 'Turbit Minerale' and Corrosive Sublimate without incurring heavy penalties." This Swedish law was the first to originate the system of drug store concessions in the land, which has survived up to the present day, limiting the number of apothecary shops. (The present legal ratio is 1 to 6000.) As the title of the law implies, it provided at the same time a uniform scale of prices, worked out and periodically revised by the state authorities, on ingredients used and services performed in prescription work. This system of the uniform scale of prices—"The Apothecaries Tax"—has likewise survived up to now, and overcharge on prescriptions results in penalties. Among the minor provisions of the law worth mentioning are: Obligatory own manufacture of all preparations, including chemicals, to sell potent remedies only on physician's prescription and to store poisons in cabinets. It is obvious that the "pine boarders" of that day—the herbalists and pepperers—were strictly prohibited from selling medicaments on the ground that, as the law put it, "the pepperers would not understand the composition thereof, nor know how to prepare them."

When the country was conquered by the Muscovite Czar Peter, surnamed the Great, the drug business of the conquered provinces fell under the medical laws of the Russian Empire. The Russian laws relating to pharmacy, however, did not differ materially from those of Sweden. We know that Peter the Great devoted his life to Europeanization of his semi-barbaric country, and incidentally codified

\* Section on Historical Pharmacy. A. Ph. A. Portland meeting 1936.

<sup>1</sup> Retail Pharmacist, Tallinn, Estonia. Formerly editor of *Pharmacia* and Head of the Department of Pharmacy in the Public Health Administration of Estonian Government.

the Russian laws on European models. For this purpose he called a number of collaborators from the West, and naturally the collaborators wrote in the law books of Russia the rules and regulations that were familiar to them. Thus, the only difference between the pharmacy law of the State of Reval and the Russian medical laws was in the manner of administration. According to these the drug stores of this vast empire of Peter were subject to the city and circuit physicians, and finally to that of the Medical Department of each province, under the management of a medical inspector. Each of these provincial medical departments was to have a *Learned Apothecary* (this provision was quite often overlooked), on whose shoulders was to fall the immediate supervision of drug stores, assaying of seized drugs and checking that the prescribed uniform scale of prices was not violated.

It is hardly necessary to repeat that the Russian medical laws held strictly to the system of drug store concessions and to the state uniform scale of prices. Not only that, but since the middle of the nineteenth century went so far as to dictate the number and kind of personnel that a store proprietor was to employ in his business, the kind of stock he was to carry and the manner in which the stock was to be stored and grouped, according to the potency of each drug and chemical. Finally, the Russian law directed certain definite store outlay and the kind of apparatus to maintain. It definitely prohibited sale of alcohol liquors and poisons without prescriptions.

When in the autumn of 1918 the German occupational forces, under the pressure of the victorious allies, had to leave Estonian soil, the newly established Estonian government soon created in the Ministry of the Interior the Public Health Administration or the office of the Chief Medical Inspector. The Public Health Administration was divided into two subdivisions—the Division of Medicine and the Division of Pharmacy with a pharmacist in charge. This division of the Public Health Administration into two independent administrative units was an important step toward pharmaceutical autonomy in Estonia. In the same year the first National Congress of Pharmacy declared that there be created an independent pharmacy administration with a director, vice-director and secretary. The memorandum of the resolution was placed in the hands of the government and action on it demanded. No action, however, was forthcoming. In 1919, the second National Congress of Pharmacy reiterated the demand of the first congress, but the results were again disappointing. As during the Russian régime, the city and county physicians remained the functionaries, under whose supervision the drug business of the country fell. Only one concession was given this time to pharmacists, the appointment of another pharmacist to the Public Health Administration, *viz*, Pharmacy Inspector or Visitor.

Though so far the pharmacists' demands for independent pharmacy administration have fallen on deaf ears, pharmacists have not given up the struggle for autonomy. The ground for it has already been paved, inasmuch as during the last 16 years most of the Russian pharmacy laws have been either modified or annulled by the legislature.

Perhaps the most radical reform has taken place in pharmaceutical education. Under the Russian system, a young man, having finished his four-year course in a secondary school called *gymnasium*, could begin his study of pharmacy by entering

a drug store in the capacity of an apprentice and registering as such with the Public Health Administration. Having worked in this capacity for three years, the young man was authorized by law to take his assistant-pharmacist's examination at any of the state universities having medical schools. To pass this examination, the candidate had to demonstrate a definite practical and theoretical knowledge in pharmacy, chemistry and materia medica, as well as in posology and pharmaceutical Latin (To be successful, he had to work a number of months with a tutor, who would drill him in theoretical subjects). Having been successful, the new assistant had to register again with the Public Health Administration and practice another three years, before he was finally permitted to enter the university for his two-year pharmacy course. Having been successful in his studies, he received the diploma of a *provvisor*, which gave him the right to manage a drug store, enter the civil service as a pharmacist or otherwise practice his profession. In Estonian pharmaceutical circles this system of training was considered inadequate. The prevailing argument was that the preliminary education of the Estonian pharmacist should be equal to that of physician. Accordingly, due to the pharmacists' demands, the Estonian legislature in 1919 passed a law whereby only the persons having the Certificate of Maturity, *i. e.*, having finished the full 7-year *gymnasium* course, could enter as apprentices in drug stores, and, after two years of practical experience, enter directly the University of Tartu, where the course of pharmacy was to be at least of 6-semester duration. Later, in 1926, the course of pharmacy at the University was increased to four years. In 1930, the preliminary practice requirement was changed to compulsory 2-year postgraduate practice.

Prior to the educational reforms there took place a decided activity in the formation of pharmaceutical associations. As the *Pharmaceutical Association of Estland*, which was established in 1897, grouped around itself only the German speaking colleagues so, in 1917, there was organized the *Estonian Pharmaceutical Association* uniting all Estonian pharmacists, and placed itself in the forefront of pharmaceutical reforms. In 1921 was founded the *Society of Estonian Druggists*, which organized the drug store proprietors of all nationalities. Soon thereafter, in 1924, was established at the University of Tartu *The Academic Pharmaceutical Association*. This was followed by *The Estonian Association for Scientific Pharmacy*, in 1927, the *League of Estonian Pharmaceutical Associations* in 1929 and finally the *Union of Estonian Pharmacists*, in 1933.

The first Estonian pharmaceutical periodical, *Pharmacia*, was established in 1921 by the *Estonian Pharmaceutical Association*. By publishing regularly the work done at the Pharmacological Institute of Tartu University, it immediately began to attract attention in pharmaceutical circles abroad, and during the editorship of this writer was proud to list among its contributors such names as Professor Goris, Dr Tschurch, Professor Thoms, Dr Dragendorff, Dr Utz and others. In 1926 was founded by the *Academical Pharmaceutical Association* another pharmaceutical monthly, *The Estonian Pharmacist (Eesti Rohuteadlane)*, which became the mouthpiece of the younger generation of colleagues. This younger generation, it must be pointed out, has not taken part in any of the various reform movements, which the older generation of pharmacists has sponsored. In order to facilitate acquaintance with the foreign pharmaceutical literature, there was established, in 1930, at the *League of Estonian Pharmaceutical Associations* the

Pharmaceutical Library in Tallinn A number of well-known foreign scientific institutions are sending regularly their scientific works to this library

Besides raising the pharmaceutical education standards, establishing professional periodicals and founding a number of trade and professional associations, the pharmacists of Estonia have succeeded in many reforms of administrative and economic nature Thus, in 1922, was promulgated the so called *Law Relating to Operating of Drug Stores*, whereby the old Russian law permitting inheritable concessions in drug store ownership was changed to simple personal concession, by which the drug store ownership was made not inheritable In 1933, the Estonian pharmacists were finally freed by the President's decree from under the supervision of city and county physicians The result of this decree was that now the pharmacists of this country are responsible only to the Pharmacy Department of the Public Health Administration In 1932 passed through the legislature the so-called "*Law Relating to Public Health Personnel*," which divided pharmaceutical personnel active in drug business into several categories, and described their rights and obligations More details about this may be found in my paper on "*Ueber die pharmazeutische Fachbildung in Estland*," published in *Die Deutsche Apotheke*, 37, 1934

At present the Estonian pharmacists are working at the task of getting a regular professor of Galenical pharmacy at Tartu University, where the teaching of that subject is not as satisfactory as it should be, calling together the Chamber of Pharmacy and establishing an independent pharmacy administration What concerns the two former shall be realized in the near future, but as to the independent pharmacy administration, there is still much to do, inasmuch as the parties in the "seats of the mighty" do not seem to realize the necessity of it

Yet, *per aspera ad astra*!

TRANSLATOR'S NOTE The author of this paper, Rudolf Wallner justly deserves the appellation "Father of Estonian Pharmacy" first applied to him by a Finnish colleague As an editor, chief of Pharmacy Department of the Public Health Administration, and the founder and for many years the president of *The Estonian Association for Scientific Pharmacy*, he has played a more vital part in the development of pharmacy in Estonia than any other man He modestly lists a number of improvements that have taken place in the pharmacy situation of his country during the past 16 years But to a person familiar with the conditions of Estonian pharmacy, it is known that had not Mr Wallner applied his tireless pen for the cause, and not used his gift of organization and his personal prestige, many of the reforms most likely, would not have resulted Higher educational requirements for pharmacy students the periodical *Pharmacia* of high professional standing at home and abroad, an association for the advancement of scientific pharmacy and the revised pharmacy laws strictly prohibiting drug vending outside of drug stores, are a few of the outstanding achievements of Mr Wallner Considering this, Mr Wallner deserves more than a passing notice by American colleagues

The beginning of Mr Wallner's professional career is characteristic of all Estonian pharmacists of an older generation the generation that began pharmacy studies during the last decades of Czarist régime when Estonia still was part of the Russian Empire He received his preliminary practical experience, as prescribed by Russian law, in the internationally known Dr Poehl's Pharmacy in St Petersburg, where, like in other large and excellent pharmacies of the Metropolis of Czars there were practically limitless opportunities for thorough familiarity with all the phases of dispensing and manufacturing pharmacy, inasmuch as a considerable amount of prescription work (under the supervision of pharmacists) and all the manufacturing not requiring physical labor, from lipsticks to sterilized ampuls, were done by students Having finished his prescribed years of practice as student and assistant pharmacist, Mr Wallner entered Tartu University Department

of Pharmacy, from which he was graduated with the diploma of *provisor*, giving rights and privileges equal to American registered pharmacists. Entering the retail field, he owned and managed a drug store of his own, devoting considerable time to botanical studies. When Estonia won its independence, Mr. Wallner was among the first to call together the *First National Pharmacists' Convention*, which he served as secretary. In 1919, we find him in Paris as a postgraduate student at *École Supérieure de Pharmacie de Paris*, working under Perrot, Goris, Weitz and Delepine. Notable from this period is his work on *Hydrastis Canadensis*, published in *Bulletin des Sciences Pharmacologique*. In 1921, he returned to Tallinn where he founded and edited the first Estonian pharmaceutical monthly *Pharmacia*. The following year the office of the Chief of Pharmacy Department of the Public Health Administration became vacant, and he was appointed to this post. This office Mr. Wallner held until 1934, retaining at the same time the editorship of *Pharmacia*, for which he secured as contributors such pharmacists of repute as Goris, Tschirch, Thoms, etc. As the result of his ability of organization there is *The Estonian Association for Scientific Pharmacy*, and very recently there was organized *The Estonian-Finnish Hungarian Pharmaceutical League*, the purpose of the latter being to draw together the pharmacists of these three Finno-ugric peoples for the scientific and economic improvement of pharmacy in their respective countries.

Mr. Wallner's publications of scientific and professional nature are numerous, published in Estonian, French, German and Finnish pharmaceutical periodicals. Of his books deserving attention are the *Dictionary of Drugs in Colloquial Estonian* and *Manuale Pharmaceuticum* in two volumes.

Since 1934 Mr. Wallner has somewhat withdrawn from public life, devoting most of his time to his prescription pharmacy and to writing.—O. L.

## APOTHECARY SHOPS OF COLONIAL TIMES

BY MILLICENT R. LAWALL \*

### FOREWORD

The following information has been gathered from various articles published in pharmaceutical literature and other sources of the past few years, with the idea of collecting in one article all the facts instead of having them scattered through many magazines and newspapers.

If you could step with me into an apothecary shop of Colonial times, having in mind a picture of the modern drug store, you would see a great contrast between the two in many ways. You would see many things to which you are unaccustomed, and miss many things to which you are accustomed. In the front of the shop you would see no large bulk windows of plate glass, with goods tastefully arranged. You would see only a flat window in most cases, flush with the house, and consisting of a number of small panes of glass, about 8 x 10 or 10 x 12 inches, about 24 panes in a window. There were no show bottles filled with colored water, they indicated that it was an apothecary shop by placing a bottle behind each pane—24 bottles in all, there were containers of colored liquid, to be sure, but they were the real thing. As there were no pharmaceutical manufacturing houses in those days, the pharmacist had to make his own preparations. He frequently grew his own plant drugs in his garden, and he made his tinctures by macerating the drugs in the proper menstruum in containers which were placed in the window, exposed to the rays of the sun—insolation it was called. When pharmaceutical

\* Section on Historical Pharmacy, Portland meeting 1935

March 1938

manufacturing houses came into being, this process was no longer necessary, and the colored show globes were substituted for the macerating drugs, and they are the evolution products of the time when the old-time apothecaries made their own preparations. You would see no lunch counter with its sandwiches, cake and ice cream, no soda fountain, for soda water had not yet been invented, no show cases as we know them to-day, no fancy candy boxes, no shelfware with glittering glass labels, you would find no beautiful torsion balance on the counter, but the old single-beam, equal arm scales with the huge brass pans suspended at the end of each arm, and if you went back into the prescription department, you would find no finely adjusted prescription balance, but most likely a small hand scale like the one in the old Glentworth store now in the Philadelphia College of Pharmacy and Science, the pans of which are made of tortoise shell suspended by cords from a beam of brass. There would be tobacco, but no cigars or cigarettes, no toothbrushes, in 1784 there were no toothbrushes in Philadelphia, those people who cleaned their teeth did it with a rag and powdered chalk or snuff, indeed, if a man cleaned his teeth he was considered effeminate.

There were no sugar-coated pills or tablets, and no capsules, people took their medicine "as is," in those days. The shelfware was as you see it now in museums—of pottery of different shapes and sizes. The syrups were kept in containers with spouts, which spouts, having no covers offered a fine opportunity for collecting entomologic specimens. There were cosmetics and perfumes, but the principal side-lines were paints, oils, varnishes, putty, window glass and garden seeds, also some fruits, such as figs, raisins and plums, no beautiful lighting fixtures. Betton's drug store in Philadelphia first showed Argand lamps in 1795, in which probably whale oil was burned. There were drugs a-plenty, in these old shops, both plant and mineral, but as for the great variety of other articles found in our stores to-day, there were none. Occasionally an old shop would be found in which the stock was an extraordinary jumble of everything, and only the apothecary himself could find anything in it.

Dr T W Dyott of Philadelphia in 1821, came the nearest to having a department store of any of the old shops. He was the largest distributor of "secret" medicines. He ran a whole sale and retail drug and family medicine house at the northeast corner of 2nd and Race Streets. He had the largest business in "panaceas" in the United States. The announcement of his remedies, and the certificates of his cures (testimonials) took up a daily half page in the *Aurora*, the *Democratic Press* and other newspapers. He had a fleet of Conestoga wagons carrying his medicines to suffering mankind in the south and west. He bought old bottles, lime and hardwood, he had a glass factory in Kensington where he made bottles, he handled garden seeds, paints, dyers' supplies, chemical and pharmaceutical apparatus, butter pots, snuff, chewing tobacco, mustard, chocolate, lard, ham, brandy, gin, sugar plums and cowskin whips.<sup>1</sup> He sold to the laboring poor at half the regular price.

He did not always carry in stock, but bartered for and dealt in rosin turpentine, lamp black, beeswax, cheese, rye whisky, apple whisky, peach brandy, pearlash, flaxseed, bristles, rags, logwood, mackerel and real estate. There is at the Philadelphia College of Pharmacy and Science, the old day book (waste book, it was called) of the old Christopher Marshall drug store dated 1774. The entries are in the fine meticulous handwriting of the period when people had time to write legibly, and nearly every other entry is for a sale of paints or oils etc. This store had quite a large trade with the ships that came to the port of Philadelphia. Conditions on these ships must have been

<sup>1</sup> It is to be hoped Dr Dyott knew enough to keep these various articles of merchandise separate from each other.

similar to those on our steamships to day, where it seems to me that when a sailor has nothing else to do they give him a pot of paint and a brush and tell him to go and paint something. These ships were sailing ships as indicated by their names, as for instance the schooner Peggy, the sloop Hope, the ship Prosperity, the brig Nancy, the sloop Elizabeth, Capt Long of the ship Success, the brig Morning Star.

The apothecary also seemed to be a friend in need for there is one entry which reads "John Dillhorn £3 (3 pounds) lent him," and also another showing that he had lent some money to Dillhorn's wife. There is an echo of slavery in the entry John Ross 1 gal boiled oil, delivered to his negro man. This store also sold drugs to the ships for their medicine chests.

The amounts were, of course in English money, pounds, shillings and pence. Occasionally the dollar or half dollar was mentioned, but always followed by its equivalent in English money, as "One dollar, 6 6". As mentioned before, the apothecary made his own preparations and there being no drug millers then he had to powder his drugs either by the use of mortars and pestles or in the crude hand mills then in existence. The mortars for powdering were usually of iron and were called contusion mortars. Sometimes the pestle would be nearly a yard long, so that the operator could stand upright, thus preventing an aching back. Sometimes the heavy mortar was mounted on a solid block of wood or on a post that passed through the floor and rested on the cellar floor. Sometimes a light springy board was fastened by one end to one side of the ceiling from where it passed across the ceiling, bringing the loose end over the mortar, this free end was then fastened to the pestle and when the pestle was brought down on the material in the bottom of the mortar and released, the spring of the board would help raise the pestle again thus lessening the labor.

Commercial manufacturing really began when some proprietor of an apothecary shop made more of some preparation than he needed, and sold the surplus to his competitor. The old apothecaries also spread their own plasters, the small ones by hand. One of the specialties of the Marshall store was spread adhesive plasters. These were made in the open air, the cloth being drawn out by hand down Vidall Court to Second Street, all hands supporting the center with canes and broom handles, in lengths of about 60 or 75 yards, then cut into length of five yards and taken into the store. Later, Isaac P. Morris, one of the proprietors of the store, constructed a machine for spreading plasters, and after this the spread plaster was reeled on drums, and 150 or 200 yards could be made at one time.

In Colonial times, if a boy wanted to learn the drug business, his parents did not furnish the money to send him to a college of pharmacy, for there were none until 1821, but he was apprenticed to some well-known apothecary for a term of years, and he earned his knowledge by hard work, for the apprentice had to do the drudgery, the rules regarding apprentices were very strict, he had to live with his master's family, he was not allowed to go out nights without his master's permission, he was not allowed to marry without his master's permission, nor was he allowed to play cards, if it would cause any damage to his master's interests. It is safe to say that the drug business would not be overcrowded to-day if every pharmacy student had to conform to these regulations. The term of apprenticeship was from four to six years. There is one of these indentures at the Philadelphia College of Pharmacy and Science, dated 1782, and signed by Townsend Speakman, an apothecary, and an ancestor of Professor J. P. Remington. Probably the most laborious work the apprentices had to do was the powdering of drugs in the contusion mortar. Old Dr. Schwettmann, one of the proprietors of the Apothecaries' Hall in Charleston, S. C., said the pestle in the store where he served his apprenticeship, which was used in the contusion mortar for powdering, weighed 22 pounds.

The first drug mill was erected by Charles V Hagner, in 1812 at the Falls of Schuylkill, Philadelphia. The first material ground in it was several tons of cream of tartar, which had been doubtfully entrusted to him by Dr Haral, a Philadelphia druggist. Hagner had offered to do it for less than 3 cents a pound, which was the price charged for doing it by hand. Hagner hauled the material out to his mill by teams, and ground it on the millstones on which he ground his plasters and paints. The mill was run by water power. It is to be hoped he cleaned the stones well before he ground the cream of tartar. He returned the powder to the amazed and indignant druggist within 12 hours. Indignant, because he said the stuff was ruined, for it was not possible to do in 12 hours what it would have taken his men several months to do by hand. A meeting of druggists and experts was called, and the powder was examined and tested, and it was pronounced very good, unusually white and the finest powder they had ever seen. Hagner later, in 1820, erected another mill in Manayunk, and thus helped to build up that portion of the city.

So much for pharmacy in general in Colonial days. Now let us look at some of the individual shops.

The earliest record we have of an apothecary shop is in 1646 when William Davies, an apothecary of Boston asked permission to erect a picket fence around his property. This was probably the first store devoted exclusively to pharmacy in America. There is also an advertisement in the *South Carolina Gazette*, of 1734 in which John Lining of Charleston announces that he has certain medicinal preparations for sale and he was evidently a pharmacist.

The oldest American apothecary shop still in existence and doing business is the Rau pharmacy in Bethlehem, Pa. During the first ten years of the existence of the town, the Moravians established a dispensary in one of the community houses on Church Street. From 1743 until 1750 it was in charge of Dr Frederick Otto and after that time his brother Dr Matthew Otto was in charge. In 1752 a one story stone dwelling and store was built for him at 420 Main Street. A frame second story was added in 1764. Dr Otto's duties as a physician called him away from the store so much that a resident pharmacist was employed Timothy Horsfeld, Jr who acted in that capacity for 28 years—from 1761 until his death in 1789. In 1790 Dr Eberhard Freytag then took charge and in 1796 he bought the stock and fixtures from the Congregation, and carried on the business on his own account for 43 years when he sold it to Simon Rau. The old building which had been built in 1752 was razed by Rau in 1862 and a larger and more convenient building erected on the same site. His brother David Rau, was associated with him until his death in 1879. After that it was conducted by Eugene A. and Robert Rau, under the firm name of Simon Rau and Company. Robert Rau died in 1906, and C. N. Lochman purchased his share in the business. E. A. Rau retired in 1913 and was succeeded by F. P. Miller, who sold his part in the business to Robert A. Smith in 1930. The store was conducted by Lochman and Smith under the old name. Lochman died in 1930 and Smith became the sole owner. Paul Clarke then came in with Smith as registered pharmacist still under the name of Simon Rau and Company. They are still carrying on in the same place and under the same name. Both are graduates of the Philadelphia College of Pharmacy and Science. There was quite an extensive botanical garden in the rear of the brethren house and there the old apothecary cultivated his drugs. An occasional plant is still found growing in sheltered corners having survived to this day. This store became famous for its beeswax Christmas candles, which are still manufactured and sent all over the country. They are made of beeswax because it burns with a smokeless flame. It is said that they are now mixed with bayberry wax, to give them the distinctive odor of bayberries. These candles were first manufactured in connection with the Christmas celebration of the Moravian Church.

This old store is said to contain enough pharmaceutical relics to start a museum. It is a pity that there is not in this country some fund or pharmaceutically in-



clined philanthropist, to preserve our old pharmaceutical relics These things are done better in Europe, especially in Germany When they have a particularly interesting old shop, it is put into a museum

Another interesting old store, which has been turned over to a museum is Apothecaries' Hall in Charleston, S C The proprietor in 1781 was Dr Andrew Turnbull, and it was founded prior to that time by somebody unknown This was known as the Schwettmann Store named after one of the well-known proprietors Nothing in the shop is positively identified as coming from Dr Turnbull's time, except the specimens of antique chairboard and cornice The rest of the interior woodwork dates from the time of Dr Jacob De LaMotta, 1816-1845, when the old shop was refitted in the pseudogothic style so popular in those times, and a specimen of which can be seen in the old Glentworth store, now in the Philadelphia College of Pharmacy and Science Dr John F Huchting was one of the later proprietors and he arranged for the transfer of the remaining material to the Charleston Museum, as a memorial to his former employer and friend Frederick William Schwettmann The shop is now set up in the balcony of the museum One of the best known relics of the store is, however, missing This is the famous old golden mortar and pestle, placed out in front of the store by Dr De LaMotta in 1838, which was kept by Dr Huchting when he moved from the old stand to a new location further up the street This was known to the negroes of the city and the surrounding country as 'The Big Yelluh Bucket'

A great variety of antique equipment is displayed, most of them English imports—crude drugs, mineral and plant old labels, strings of dusty antique prescriptions carboys crucibles, gallipots, pincers for teeth-pulling and cups for bleeding The following is taken from *The American Druggist*

John Bennett, curator of the Museum is perhaps best able to trace the history of the old shop from its opening day in 1740 'It saw the last of the British crown,' he says, the King's Lieutenant-Governor William Bull, Lord Cornwallis in his powdered wig Balfour, Benjamin, Count Rumford John Rutledge, Christopher Gadsden the Pinckneys Moultrie, Sumter Marion, Gen Nathaniel Green, President Washington and his nephew Will, Lafayette, Calhoun the Hamptons Robert E Lee and all the notable men of ante bellum days It has welcomed President Davis and watched President Taft ride by' It has seen more history parade before its portals than probably any other shop in America, twice the store withstood sieges once when the British bombarded the young Charleston, again when Federal shells crashed into the Confederate stronghold—one of them bursting in the shop itself But perhaps its most novel thrill was a riot of superstitious ex-slaves, shortly after the Civil War and was caused by nothing more than a toad in a jar of alcohol It had been raining steadily in Charleston for a long time and the rumour spread that the rain was caused by a mermaid which the proprietor of the old store, Dr Trott, had in captivity, and that it would not stop until the mermaid was released So intense did the feeling become that a mob gathered Stones were thrown through the windows and finally the crowd pushed through the doors and ransacked the store, frantically searching for the cause of the trouble, and found a toad in a jar of alcohol To this day there remains an old toad in its jar of alcohol a mute reminder of the comic though dangerous occasion "

Another interesting old shop is the Heimtsch Pharmacy in Lancaster, which however, was changed and remodeled in 1934 Members of the family are proud of the fact that the pharmacy has been in their possession for 147 years, and unlike many other old stores which were conducted under the names of different owners as time went on and the stores changed hands the Heimtsch pharmacy has almost invariably had the Heimtsch name in the firm name, it has been a family affair, for when there was not a Heimtsch to run it a relative of the family kept up the old tradition First there was Carl Heinrich Heimtsch the founder who came from Leipzig Germany, and settled in Lancaster, Pa as a merchant, in 1780 he opened the drug store, in 1803, the firm name was August Heimtsch, in 1815 Heimtsch and Co in 1816 A and J F Heimtsch, in 1841, J F Heimtsch and Son, in 1849 Charles Heimtsch who in 1882 was President of the AMERICAN

PHARMACEUTICAL ASSOCIATION, in 1899, S W Heimtsch, in 1911, A S Heimtsch, in its later days it was under the management of E L Page, a relative of the family. Here in this store, among the relics, was the sheepskin of the founder, dated 1759 at Lutzen, Germany, a Bible written by hand in German script, and a copy of the first U S Pharmacopœia, called the Military Pharmacopœia, compiled by Dr William Brown, for use in the Continental Army Hospital at Litzitz, Pa. This, which is a second edition, is now in possession of the Philadelphia College of Pharmacy and Science, having been purchased from the Heimtsch estate. Only two other copies of this edition are in existence—one owned by the Pennsylvania Historical Society, the other one by some person unknown.

Probably the most interesting of the Colonial apothecary shops was the Mercer apothecary shop, kept by Dr Hugh Mercer—the apothecary-patriot, as he was called at Fredericksburg, Va. Although no longer in business, this old store has been restored to its original condition, and is preserved as a museum. This shop was notable because of its connection with George Washington.

Dr Hugh Mercer was born in Scotland, was educated in medicine in that country and came to America in the middle of the 18th century. He served in the French and Indian War, at which time the lifelong friendship between him and George Washington began. Probably because of this friendship, he came to Fredericksburg and opened an apothecary shop in 1764 and from 1764 to 1776 Washington spent a great deal of time in the store. He had a desk here at which he figured up his accounts and attended to his correspondence, in fact, he made this shop his headquarters in Fredericksburg. Other frequenters of the shop were Chief Justice John Marshall, who also had a desk there, Madison Monroe, George Mason, Col Fielding Lewis, Washington's brother-in-law, and many others, who congregated there to discuss pre-Revolutionary events. When war finally came Dr Mercer again joined the Continental Army, was made a brigadier general, and led the van of Washington's troops on the march from Princeton to Trenton, where he was mortally wounded, died and was buried in Philadelphia in January 1777, with military honors. He was first buried in the churchyard of historic Christ Church, but his body was later removed to Laurel Hill Cemetery. Not far from the old Mercer House, Congress erected a monument with the inscription "Sacred to the Memory of Hugh Mercer, who died bravely defending the liberties of America."

Dr Mercer's house in Fredericksburg had two rooms in front, one of which was his consulting room where he blistered and bled his patients and prescribed for them and the other was the apothecary shop where he prepared his medicines and filled his prescriptions, for the doctor was his own apothecary. At the rear of the house was his herb garden, where he grew many of his drugs. Back of the consulting room was the small room containing Washington's desk where he spent so many hours. After Dr Mercer's death, the little house was used as a dwelling, and gradually deteriorated, until in 1928 it was taken over by the Citizen's Guild of Washington's Boyhood Home, and has been faithfully restored to a typical apothecary shop of the Colonial period. In the course of the restoration of the shop part, the drawers and shelves, with pigeon holes and niches to hold containers of varying shapes and sizes, were found intact, having been lathed and plastered over by a later occupant. To day they are completely equipped like an 18th century pharmacy, with pill rollers, cork pressers, mortars and pestles, brass scales and huge green glass liquor containers. There are brandy rum and whisky containers of cherry red porcelain, banded with white. Some of the articles on display were the personal property of Dr Mercer, including his rosewood, ivory-tipped carrying case, each tiny bottle with its label, faded but still legible.

An interesting feature of the house was the powder closet. This was a closet on the second floor, in the door of which near the top a round hole was cut, large enough to admit a man's head.

Here the men came and thrust their bewigged heads through the hole to have them powdered so that the powder would not get on their clothes. This was probably the first men's beauty shop in the country.

Another interesting shop, famous also for its connection with the Washington family is the Leadbeater Store at Alexandria, Va. The following account of it is taken from the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION for November 1934.

In 1792, young Edward Stabler borrowed 120 pounds from his uncle to buy stock and fixtures for an apothecary shop which he wanted to open in Alexandria. He did not then know

that he was starting a business that would be carried on by his descendants for 141 years. The business prospered so that he was able to return the loan and double his stock within a year. The original bill for stock came from Townsend Speakman, in Philadelphia, an ancestor of Prof J P Remington. There were 150 items on it. Three of these articles are still in existence—two heavy marble mortars, and a quart flint glass bottle labeled 'Spt Nitre'. This bottle was in continued use since the founding of the store until 1933, when the doors were closed after the last customer and the store no longer functioned as an apothecary shop. Washington was a frequent visitor here, he bought his medical supplies here, and after his death, his family continued to deal with Mr Stabler. There were a number of documents in this store in the handwriting of members of the Washington family, and it is a pity they were not preserved but they were handed to different people and scattered. One reads as follows:

'Respected Friend Here is a check for 77 9, the amount of your account which ought much sooner to have been attended to. I will thank you to send it to me more frequently, at least once a year

Respectfully  
Bush Washington "

Judge Bushrod Washington was a nephew of George

An example of the leisurely way in which things were done in those days, is the correspondence between Mr Stabler and the London firm of Allen and Howard. In a letter dated 1801, Mr Stabler ordered

'One medicine chest complete with weights scales bolus knives etc. I want this to be of mahogany of good quality as it is for the granddaughter of the widow of Gen Washington the cost to be about 12 guineas. It was not until the following year that the London firm billed the apothecary for a mahogany folding door medicine chest, complete at 11 pounds, 11 shillings and shipped it on the sailing vessel Union Thomas Woodhouse Master. The name of a grandnephew of George Washington was found scrawled on one of the interior walls of the vault, and several of this generation owed their business training to a boyhood connection with this store two of these nephews are now druggists in West Virginia.

Half a century or more passed between the days when the first President chatted with Edward Stabler, the founder, and a later day when another great general Robert E Lee came to the store to discuss passing events with Edward Stabler Leadbeater the grandson of the founder. One of these talks was abruptly interrupted one day by a messenger afterward identified as J E B Stuart, later leader of cavalry under Lee in the Civil War who came with the news of the raid on Harper's Ferry, and the order that Lee was to go and quell the insurrection. Lee was at that time an officer in the Union Army.

Mr Leadbeater was unwilling to take oath of allegiance to the United States. His sympathies were with the South, but his religious scruples prevented him from joining the Southern Army and he could not submit to the edict that those business houses whose clerks did not take the oath, must close. But Mr Lewis Mac kenzie, a Union adherent and Justice of the Peace, declared that he would not trust anybody to put up his prescriptions but Ned Leadbeater and oath or no oath the store must not be closed, and it was not closed.

In the rear of the store is a large desk, and set in on each side is a mirror one bearing in gold leaf the figures or date 1792 " and the other '1892' thus indicating a century of service. Above these mirrors in gold leaf are the various names under which the business was conducted until 1865 as follows

1792 Edward Stabler  
1820 E Stabler and Son  
1831, Wm Stabler  
1840 Wm Stabler and Co  
1844 Wm Stabler and Bro

1852 John Leadbeater  
1857, Leadbeater and Son  
1860 Leadbeater and Co

The following names should be added

1892, E S Leadbeater and Sons  
1903, Leadbeater and Sons, Inc  
1916 Leadbeater Drug Corporation

There is a plate on the front of the desk in honor of Robert E Lee There are two plaster casts on top of the desk, one at each end, of George Washington and Benjamin Franklin A story is told of a small boy, who on being asked whom these busts represented, quickly replied "Why, George and Martha Washington, of course " Those of you who have seen some of the pictures and casts of Franklin, can excuse the boy, for they do look rather like a placid old lady

The interior and exterior of the building is now being restored by the Landmark Society of Alexandria, and will be kept open as a museum, the first floor as a memorial to General Lee, and on the second floor the old apothecary shop will be set up

Now let us go back to Philadelphia, the home of so many "firsts," and of so many of the leaders in pharmacy at that time There were upward of twenty apothecary shops in Philadelphia in Colonial days, but none of them had the reputation or held the position that Christopher Marshall's did

"Christopher Marshall was born in Dublin, Ireland in 1709 He came to this country and was for some years a resident of Bucks Co , Pa , and was a member of the Middletown Meeting of the Friends or Quakers Later he came to Philadelphia and established himself in the drug business in 1729, at Front and Chestnut Streets In 1735 he purchased a property on the south side of Chestnut Street, east of Second Street, present number 214, where he continued the business He was a Friend, and while his principles forbade it, he favored the cause of the colonists With other militant Friends he seceded from the Society, to build and support the Free Quaker Meeting House, still standing at the corner of Fifth and Arch Streets He was a remarkable man in his day and occupied many positions of trust in the infant city He was known as the 'Fighting Quaker of the Revolution,' and was an active member of the Committee of Inspection and Safety of Philadelphia His Remembrancer' or Diary of the Revolution is one of the most interesting and important records of the War for independence His two sons Christopher Jr , and Charles, became his partners in 1765, and succeeded to the business and Charles later became the manager

' Charles Marshall was an apothecary druggist botanist and chemist His shop had the reputation among the doctors as a place where they could get pure drugs, good service and have their prescriptions carefully and properly compounded He worked in his laboratory with knowledge and skill He always had from 6 to 12 alert, capable young men working in the front of the store and in the back room, making preparations and filling prescriptions

"Many of the city's most notable apothecaries were trained in this store including Charles Ellis, who later bought the store Dillwyn Parrish who later had a store at 8th and Arch Streets and was one of the presidents of the Philadelphia College of Pharmacy, and the first president of Haverford College, Frederick Brown, the originator of Brown's Jamaica Ginger, and who went into business for himself at the northeast corner of 5th and Chestnut Streets He was one of the founders of the Philadelphia College of Apothecaries, as was Charles Marshall who was the first president of that venerable institution Charles Marshall withdrew from active participation in the business in 1801, but unfortunately retained an interest in it and when in 1804 the firm became insolvent through endorsing a note, everybody connected with it was involved in bankruptcy "

Enter now Elizabeth Marshall, or "Betsey " as she was called who became business man-

ager, and pulled the business out "of the red," and put it on a sound financial basis. She was probably the first woman pharmacist. She continued to manage it until 1825 when the store was sold to Charles Ellis and Isaac P. Morris. The Marshalls were probably the first to manufacture chemicals. As early as 1786 they made muriate of ammonia in their laboratory on North Third Street. They also manufactured Glauber's Salt, the first manufacturer of this in the country, but it is safe to say that they did not take advantage of the gullibility of the public by selling it under a coined name at a high price.

Another important pharmacy of this period was that of John Speakman, at the Southwest corner of Second and Market Streets. This shop was especially notable because it was in a room on the second story over this shop that one of Philadelphia's most famous scientific institutions was born—The Academy of Natural Sciences, now at 19th and Race Streets. John Speakman and five associates organized the Academy on January 25, 1812. One of the associates was Gerard Troost, the first professor of chemistry at the College.

John Bartram, son of old John Bartram, the famous botanist, had an apothecary shop at 2nd and Arch Streets, and his brother Isaac had one on Arch Street. One may wonder why these important stores were established so far from what is now the business center of the city. The principal reason is that this section *was* then the business center of the city. Dr. Arny, in speaking of Philadelphia in 1821, says that Philadelphia was then the most important city in the United States; it had 137,000 inhabitants, New York ranked second. Southwark seemed to be the southern edge of the city. In 1826 Edward Needles, then in business at 12th and Race Streets, was called the frontier apothecary, since across the street was a large field enclosed by a rail fence, and in 1829 when Biddle opened a store at 11th and Arch Streets, he was afraid he had made a mistake in going so far out into the suburbs. Most all of these old shops had special names usually exemplified in their signs. Among these were The Golden Ball (the Marshall Store), there was a Golden Mortar and The Golden Spectacles was at Second Street between Black Horse Alley and Market Street. This was also the time when corn-meal mush was considered to be a delectable dish. An advertisement in a newspaper of the day states that a certain restaurant would serve corn meal mush every Saturday night.

Four generations of Wetherills were druggists in Philadelphia. Samuel, the founder, was a Quaker of such prominence that the most eminent people of his day were attracted to him. Samuel, Jr., was the first manufacturer of chemicals on a large scale in the United States. The drug store was at 65 N. Front Street, in 1789. Samuel was succeeded in the drug business by Samuel, Jr. and John Price Wetherill, a grandson of the founder, succeeded his father.

The store of George Glentworth was opened in 1812 at the southeast corner of Sassafras (now Race) Street and Chester Street. Glentworth was one of the founders of the Philadelphia College, and his certificate of membership in the Philadelphia College of Apothecaries, probably the only one in existence now, is in possession of the College. The family conducted this store for over 92 years without making any change in the arrangement or fixtures. It was then given to the College and part of it is now set up in the building in a room on the second floor much as it was in the old days. There are the old heavy brass counter scales and the small tortoise shell hand prescription scales. Over the prescription case there was a figure of an owl, cut out of a flat board, with movable glass eyes and a movable beak. These movable parts were attached to a string which ran down behind the counter, and could be worked by the clerk for the amusement of the children who came into the store. Underneath the counter was a bunk where the apprentice slept so he could answer the night bell.

Sometime ago there was published in a Philadelphia paper, an account of Mrs. Bok having found in the effects of her father Mr. C. H. K. Curtis the front of an old clock, and what interested her about it was a picture on it of an old drug store formerly at 6th and Chestnut Streets, the site of the present Ledger building. This was the store of Elias Durand, a young Frenchman who worked in a chemist's shop in France and who was appointed a pharmaceutical aide in Napoleon's army. He served in the hundred days' campaign, came to America in 1816 and in 1825 opened this store. He imported his stock and fixtures from France. The store had mahogany drawers and marble counters and was quite the most magnificent store in the city at that time. He was a member of the Academy of Natural Sciences, and a vice president of the College. In this store he introduced into America the business of bottling mineral waters. He wrote a series of magazine articles mostly on pharmaceutical subjects. One of the most interesting of these was the story

of F A Michaux, the famous French botanist, for whom the Michaux Oak Grove in Fairmount Park is named 'Durand collected a great number of herbs and plants, over 100,000 specimens which he shipped to France. He died in 1873 at his Broad Street home in Philadelphia.

Another prominent apothecary of Philadelphia was James Cutbush. A Lyceum was built in 1812 at Chester and Race Streets opposite Glentworth's store, and Cutbush, an apothecary at 25 S 4th Street, gave lectures here on chemistry, pharmacy and mineralogy, and demonstrations of laughing gas. Cutbush was made an assistant apothecary general in 1814, and continued until 1820 (living in Philadelphia all the time), in which year he became professor of Chemistry at West Point.

The first free dispensary for the sick poor was established in Philadelphia in 1786, and was called the Philadelphia Dispensary. In 1922 it was merged with the Pennsylvania Hospital at 8th and Spruce Sts. The Pennsylvania Hospital had a contract with the Continental Army for the use of its 'elaboratory' for the purpose of preparing and compounding the medicines for its military hospitals in 1768. The elaboratory was seized and used by the British Army during its occupation of Philadelphia.

This review of Continental pharmacy would not be complete without mention of Dr Andrew Craigie, the first Apothecary-General of the United States. In 1775, the Congress of the Massachusetts Colony appointed him medical commissary and apothecary to the army raised by that Congress for the defense of the Colony. In 1777, the Medical Committee of the Continental Congress recommended a reorganization of the medical department, February 27th. It provided for the office of Apothecary-General, and authorized this office to appoint three assistant apothecaries in different parts of the United States. The Apothecary-General's income was fixed at three shillings a day, with six shillings a day for rations. Dr Craigie was the first appointee to this office. Dr Wilbert gives the following interesting account of Dr Craigie: "He purchased the Vassall estate in Cambridge, of 150 acres. All visitors to Cambridge are familiar with this dignified English style country house. For years it was known as the Craigie House, now it is known as the Craigie-Longfellow House. This mansion has more historic interest than any other house in New England, and with the exception of Mt Vernon, is the best known residence in the country. Mrs Washington visited there while Washington made it his headquarters. She traveled with four black horses and postillions and servants in scarlet livery. Dr Craigie gave magnificent entertainments there. He had a greenhouse and an icehouse on the premises. Some thought that a judgment would come upon one who would thus attempt to thwart nature and the designs of Providence by raising flowers in winter and keeping ice underground to cool the heat of summer. He was instrumental in having the bridge called Craigie or Canal Bridge built, from Lechmere Point to Boston. This bridge is said to have been the inspiration of Longfellow's poem

'I stood on the bridge at midnight  
As the clocks were striking the hour "

Craigie died in 1819 at the age of 76, poor and friendless.

A figure of prominence in medical and pharmaceutical circles in Colonial Philadelphia was Dr John Morgan. He was graduated from the College of Philadelphia (founded by Franklin about the middle of the 18th century), receiving his college degree and then, in 1760, went to Europe to complete his medical education. He studied in London, Edinburgh and Paris, and returned to America and founded the first medical school attached to any college or university in this country—the

Medical School of the College of Philadelphia The Medical Department of the University of Pennsylvania was established in 1779, and in 1791 these two medical schools, by act of the Pennsylvania Legislature, were united under the University of Pennsylvania

Morgan was an earnest advocate of the separation of medicine and pharmacy as two distinct callings While in Europe he wrote "I am now preparing for America to see whether, after fourteen years' devotion to medicine, I can get my living without turning apothecary or practitioner of surgery In an address delivered at the Commencement at the College of Philadelphia, May 30, 1765, he also said

"We must regret that the very different employment of physician, surgeon and apothecary should be promiscuously followed by any one man They certainly require very different talents

"The business of pharmacy is essentially different from either, free from the cares of both, the apothecary is to prepare and compound medicines as the physician shall direct Altogether engaged in this by length of time, he attains to that skill therein which he could never have arrived at were his attention distracted by a variety of other subjects

The wisdom of ages approved by experience the most certain test of knowledge has taught us the necessity and utility of appointing different persons for these different employments and accordingly we find them prosecuted separately in every wise and polished country

'The paying of a physician for attendance and the apothecary for his medicines apart, is certainly the most eligible mode of practice, both to the patient and practitioner The apothecary then who is not obliged to spend his time in visiting patients, can afford to make up medicines at a reasonable price and it is as desirable as just in itself that patients should allow fees for attendance—whatever it may be thought to deserve

"They ought to know what it is they really pay for their medicine and what for medical advice and attendance "

Morgan's recommendations, however, did not meet the approval of his contemporaries The drug store, when it existed at all, was only a warehouse from which the physician might obtain his supplies Not until Dr Abraham Chovet came to the city from Jamaica, was there one in town who would adopt the plan of writing prescriptions for his patients Dr John Jones followed, and by the end of the 18th century the custom was rather general, not only in Philadelphia, but in the other cities of the colonies The apothecary thus came to occupy his own separate place in the community, and though as yet a man of no great standing, in such a manner were the foundations of pharmacy established

Dr Morgan was one of the founders of the first medical society in the province—the Philadelphia Medical Society, organized February 4, 1765 He was undoubtedly the first teacher of the theory and practice of medicine, *materia medica*, pharmacy and pharmaceutical chemistry in the country He was the second apothecary at the Pennsylvania Hospital He also had another title to fame He was the first man in Philadelphia to carry a silk umbrella Two of his friends, Parson Duché and Dr Chancellor, presently joined him in the "outlandish" custom An old account says, "they were bawled out and razzed as they walked along High Street " Even polite society poked fun at them, but they persevered, and every

time it rained, more came in out of the wet under the "new-fangled and effeminate contraption "

What incensed the Tories of that day more than anything else was the fact that Dr Morgan, contrary to the old customs, neither carried nor compounded his own medicines. He actually had the chemist make his pills and mix his potions. And what medicines there were in those days. Most of the popular herb lore came from the Indians. Goldenrod was the specific for dysentery. Alder buds and dittany purified the blood. Boneset was the sure cure for consumption. People could understand dosage with black, horrible concoctions, but anatomy, such as Dr Morgan and Dr Shippen practiced, was a devilish thing. A building on North Third Street, over the Cohocksink Creek, was professedly a place for boiling oil and making hartshorn. But the town gossips and rumour mongers knew better, and told a great deal more than they knew. The neighborhood was shunned by all pedestrians at night. The grave robbers deposited their gruesome burdens there under cover of darkness, and when, two weeks later, black smoke poured from the chimneys, it was Drs Morgan and Shippen at their nefarious work.

The soda fountain being one of the principal assets of the modern drug store, it might be interesting to know how soda water came to be. It was invented by the Rev J B Priestley, the discoverer of oxygen. While preaching in a chapel at Leeds in England, he lived near a brewery, and became interested, as a chemist, in the possibility of utilizing the gas that came from the vats. He also experimented on the solubility of carbon dioxide in water. A Philadelphia physician, Dr Philip Syng Physick, became interested in Priestley's experiments, and asked a Philadelphia pharmacist, Townsend Speakman, to prepare carbonated water for his patients. Speakman, to make the water more palatable, added fruit juices, and thus was born the popular American drink, in 1807.

Dr Edgar Fahs Smith said "The first soda water was dispensed regularly to patients from fountains at \$1.50 per month, for one glass a day."

It is interesting to know that Benedict Arnold, the Revolutionary traitor, once kept a combined drug and book shop at New Haven, Conn., in 1762. The sign read "Benedict Arnold, Drugs and Books. *Non sibi sed toteque*."

Pharmacy can well be proud of its heritage of its "fathers of old." They were, as a rule, staunch old gentlemen, skilled in their craft, patriotic, interested in education and science and an honor to their profession.

"None so learned, but nobly bold,  
Excellent hearts had our fathers of old"

#### A 'MEDICAL CITY' NEAR STOCKHOLM

A complete "medical city" is being constructed near Stockholm by the Swedish government. It will cost \$10,000,000.00 and will include the latest hospital equipment as developed in all parts of the world.

The main building will be H shaped, with a roof for sun bathing, and will be seven stories high. It will contain operating theaters, lecture halls, wards and laboratories.

In addition there will be a children's hospital, a building for psychiatric diseases, a rheumatism clinic, swimming pool, football grounds, tennis courts, church, concert halls and homes for staff, doctors, students and nurses.

Plans for the project were originated in 1931 and work on roads and excavations started in 1932. The foundation stone for a special clinic on cancer has been laid by King Gustav.



# THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS  
DEPARTMENT

## COMPLEXITY OF COLLEGE LIFE

BY C B JORDAN

Time was when the student considered himself fortunate if allowed to sit at the feet of the instructor and he asked nothing of the instructor except that which he cared to give voluntarily. The educational institution of the early day felt little or no responsibility for the student. He could come and go as he saw fit. If he was successful in passing a course, he received credit for the same, if not successful, he tried it again or made no other effort to secure the credit.

The instructor was all important and almost infallible as far as the knowledge of the subject was concerned. There was little or no tendency to question the views of the instructor nor the statements of the textbook from which he taught. The teacher was held in high esteem and shown every courtesy.

Going to college was a real event, not only in the life of the student but also in the lives of the members of his family and of the community in which he lived, because few were fortunate enough to have such an opportunity. Usually only those who were very desirous of an education made the effort necessary to secure one. The student came to college with a determination to succeed. In other words, only the selective few, deeply interested in education, came to college.

In contrast to these conditions, we now have hoards of students entering our colleges, many because they have a real desire to secure an education but also many because it is "the thing to do" and because a college education will assist in securing a white-collared job. We do not receive a selected list of students to-day, but all, good and bad, bright and dull, interested and uninterested, ambitious and lazy, all are passed into the hopper of the educational mill and all, or nearly all, hope to come out at the other end as fine, white flour of collegiate grade, ready and competent to accept the lucrative white-collared job that will be awaiting them.

The attitude of the student and of his parent toward our educational institutions has changed. No longer is it that, "We hope Johnny will be capable of taking an educational training with good advantage to himself and his alma mater," but instead the attitude is, "We expect you to give Johnny an education that will make it possible for him, regardless of his interest and ability, to go out and conquer the world at a salary of from \$4000 00 to \$6000 00 a year." "If you fail my boy, there is something wrong with you." "You do not make your courses interesting enough for him or you expect too much of a boy who must have his fun in college." "You, his teachers, are to blame." "Johnny was always a good student in high school and what has happened between high school and college?"

I fully realize that the conditions I have described do not apply to all of our college students, but I do maintain that it applies to too many of them. How often do we find students saying that they would go to class regularly if the instructor were a good one and presented his material in an attractive and interesting way. The surprising thing is that it is usually the poor student who has difficulty in main-

taining himself that complains of boredom in classes, while the good student, the one that naturally would be bored by an uninteresting instructor, does not complain. There are good and poor instructors and some that never should have been employed, but the poor ones are few in number and are usually weeded out early in their service. Therefore, the charge that the instructor is to blame is rarely true and it seems that we are receiving more and more students that expect the college to give them an education. The waste from our educational mill speaks volumes regarding the misfits that hopefully enter the hopper.

What are the colleges doing to correct this condition and to avoid this wasteful process? Surely the college owes an obligation to the citizens of the state and an even greater one to the boys and girls that matriculate. Is the college doing all that it can to save every one of these young people that it is possible to save and to turn out into the world graduates that will be a credit to themselves, to their state and to their college? If not, then the college is failing to fulfil its mission and is unworthy of the support that the state gives to it. Let us examine some of the activities of our colleges, indicating that they are alive to this serious situation.

a *Entrance Requirements* —These requirements are made just for the purpose of preventing or reducing such waste to the minimum. However, if the college is a state institution and an integral part of the public instruction of the state, it is almost compelled to accept *every* graduate of a commissioned high school that meets their requirements, regardless of whether the student is at the head or the foot of his graduating class and, unfortunately, the student at the foot of the class is often the one who decides to go to college and frequently the one who selects the most difficult course in college. It then becomes the duty of the college to give such a student as much guidance as possible.

b *Orientation* —Nearly every college gives orientation tests for the purpose of securing information that will assist the faculty in guiding the student. These tests are not infallible but they are very good indicators of what the student is able to do. If he is in the lower tenth of the entering class, the college is safe in assuming that he will have grave difficulty in carrying his work. If he is in the upper quarter of the entering class, he should carry his work with little or no difficulty. The latter student does not fail because of poor mental ability but may fail because of ill-health, lack of ambition, lack of interest in his work or some similar reason. It is the duty of the college to determine why such a student is failing and correct the fault or advise the student to leave college. The student in the lower tenth of his class presents a much more difficult problem, especially if he be a determined, hard-working student. The college cannot say to him, "You will fail," because that may be the most disastrous thing that could happen to him. Instead, the college must guide him as best it can and point the way to a successful life without a college education. In the case of the broad middle group of the class, most of them who are ambitious and willing to work will be successful unless they are enrolled in courses in which they are not interested. I know of no way of crushing a student's initiative that is more effective than that of forcing him into a curriculum in which he is not at all interested. Some pharmacists think that their sons or daughters should make good pharmacists because the parent is successful and force them to continue in the professional training long after it is obvious that they have no interest in it. This is a serious mistake. Such a student should be allowed to

choose his curriculum or be taken out of college until he has made up his mind as to what he is most interested in. Some of our happiest people are those who are doing a worth-while work in which they are interested and take delight even though they have never graduated from college and are perhaps unknown outside of the small circle of those whose lives they touch.

c *Student Health* —It goes without contradiction that no one can be happy and successful if they are not healthy. Too often this important matter is neglected and students, either of their own will or that of their parents, continue in college to the permanent detriment to their health. Some students are ignorant of the fundamental laws of health and many of them are exceedingly careless in obeying these laws. It then becomes the duty of the college to give health information and to emphasize the importance of obeying health laws. The desire to graduate with their class or to enter on their life's work as early as possible will sometimes cause students to ruin their health. It is the duty of the college to look after the health of the student body, not only for the purpose of preventing some from ruining their health, but also to protect the students from contagious diseases and to keep all in a healthy condition. Any college that fails to make provision for the necessary instruction in health matters and to take care of its students who are ill is failing to do its full duty.

d *Physical Exercise* —Students are quite prone to forget the importance of physical exercise in the development of a healthy body. Therefore, the college should provide facilities and instruction and require participation in exercises that are necessary to proper health conditions. Again individuality comes in and the student who needs corrective exercises should be singled out and given the proper kind and amount.

e *Personnel Service* —It is fully recognized that no two students are the same in all respects and yet colleges are compelled, because of the great numbers, to group them in large classes and treat them all alike in the formal instruction of the class. This makes it necessary that some other mechanism be set up to handle the individual differences, especially those that are unusual. Here is the place for personnel work and every college should have trained personnel officers, one for the young men and another for the young women. Where such formal handling of the problem is impossible, the whole staff of instructors should be very conscious of the needs of the individual student and make an energetic effort to give the student guidance even in private matters that often confront and confuse him. Whether there is a formal mechanism for handling such matters or not, the good instructor will invite confidence and will feel it a duty to give needed guidance. If this is not done, the college is missing an opportunity for instruction that is often more important to the student than any course he may pursue.

f *Extra-curricular Activities* —Every college should offer opportunities for extra-curricular activities, such as athletics, debating, literary societies, dramatics, editorial work, etc. These activities are excellent and a great help in developing the "all-around" student. Some of the greatest benefits of college life come from just such activities. However, there is a great danger of the "side shows" being so attractive that the student loses sight of the "main tent." As in eating, a balanced ration, in this case, of curricular and extra-curricular activities is most important for the intellectual health of the student. The college must exercise sufficient con-

trol over these extra-curricular activities to prevent the student from too much indulgence. In some cases, no extra-curricular activity should be permitted and, in other cases, considerable participation should be allowed and, in certain cases, the student should be urged to participate. The good judgment of the Faculty should always be in evidence in giving proper control in these matters and here the college has a duty to perform that is sometimes quite as important as any other duty.

I think I have said enough to show that the modern college with its complex student life has duties never dreamed of in earlier years. Unfortunately, it costs money to provide the facilities and guidance required to-day but this is an important item in the budget of every well-ordered college and one that cannot afford to be eliminated. The colleges of pharmacy connected with large educational institutions are fortunate in that the parent organization provides many of these things, but this does not relieve the individual teacher of his responsibility to his students as far as guidance, counsel and kindly interest in them are concerned. The teacher of to-day must be more than an instructor in the class room. He must be a leader, inspiring, counseling, directing and enthusing his students, both collectively and individually.

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## THE CHANGING ATTITUDE OF GOVERNMENT TOWARD PROFESSIONAL PHARMACY \*

BY ARTHUR D. BAKER <sup>1</sup>

The AMERICAN PHARMACEUTICAL ASSOCIATION as organized by pharmacists represents pharmacy as a profession rather than as a means of mass merchandising. It always has been the one drug association which placed its emphasis on the service rather than on the business side of selling of drugs. It is my purpose in this article to briefly discuss the various changes in governmental trends which have transpired during the years, and the underlying reasons behind these changes.

I believe most of us here can remember the time when it was difficult to obtain the passage in Congress and in various State legislatures of laws increasing the standards of the men supplying necessary drug needs of the various communities. As time went by the problem became somewhat easier, and then about fifteen years ago came the mass merchandising *era*, and the business methods adopted by various individuals and corporations in the drug profession temporarily brought about increased difficulties in presenting the professional aspects of pharmacy to our legislative bodies, our executives and our courts. Let me describe some of the methods which operated temporarily to bring our profession into disrepute, or at least caused the general public to regard the business of vending drugs with less respect.

Mass merchandising depends for its success upon price appeal to drug purchasers. It involves the removal of the personal element in dealing with the public. Shortly after its inception the manufacturers of widely known proprietaries and patent medicines instigated a policy of direct national advertising in magazines,

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\* Section on Education and Legislation, A. P. H. A. Portland meeting 1935

<sup>1</sup> Secretary Colorado Board of Pharmacy

newspapers and by radio, intended to sell their product to the consumer not on the recommendation of the individual pharmacist as a professional man, but on the basis of competitive advertising. The amount of advertising depended not on the integral worth of the product advertised but on the financial condition of the advertiser and the gross profits derived from sales. This system of advertising the product direct to the consumer of necessity lessened the influence of the independent pharmacist in recommending what he considered worth-while products, and further, lessened the reliance of the consumer upon the judgment of the pharmacist.

A natural result of this system, because of its temporary success, was its imitation by the large pharmaceutical manufacturing houses of the country. Intensified detailing to the physicians of the products of these companies was instituted and was supplemented by advertising the products to the physicians by direct mail throughout the country. In addition, direct newspaper and magazine advertising to the consumer was begun, of the products detailed and advertised formerly *only* to the physician. All of us know the result which followed.

The prescribing of U S P and N F preparations became less and less, and the particular proprietaries taking the place of the U S P and the N F preparations, dependent more or less upon the last product detailed to the physicians. As a result it was a common experience for a pharmacist to stock a preparation prescribed once or twice by a physician, only to have the remainder left on his shelves through the ensuing years. Aside from the financial losses involved because of this system, again the independent pharmacist suffered a loss in reliance on the part of the consuming public.

A further pernicious result of this detailing and advertising system was the growth of self-medication on the part of the public. Physicians adopted the habit of trying out these detailed preparations on their patients by handing them the sample without destroying the label. They would tell the neighbors about the product and the neighbors would demand it in the pharmacy by name. Physicians have complained about the counter prescribing of the pharmacist, but it is my opinion that 90% of what they term counter prescribing is self-medication taught by the physicians themselves and through direct advertising to the general public.

Into the picture thus created by the changed system of the manufacturers entered the predatory members of our profession. If the manufacturer depends for the sale of his products upon a complete ignoring of the middle man, why should they not ignore the professional aspects of our business and carry on the retail trade along the same lines. Thus the chain store and the cut-rate store came into existence. The business of the individual independents was so far curtailed that they were unable to maintain the proper equipment and pharmaceutical stock for the professional side of their business. It came to the point where many of the registered pharmacists were really incompetent to handle the duties in the few remaining ethical pharmacies. Further lack of reliance in the neighborhood pharmacist was instilled in the minds of the public.

What effect did the above-described picture have on the attitude of the Government and its agencies toward professional pharmacy? Our law-makers, executives and judicial bodies are a part of the consuming public so far as we are concerned. The breakdown in the morale of our business, the attitude of the preda-

tory members of our profession, the direct appeal of the manufacturer to the consumer all had their effect upon the men exercising our governmental functions. As a result a barrier arose which was hard to break down when a public health measure relating to pharmacy was presented to these bodies. Looking at the chains and the cut-rate stores, the individuals representing our Government were unable to understand why pharmacy should be considered as a profession. It appeared to them, even though it might only be on the surface, that the drug business was in the same category as the grocery business, hardware business or any other retail business. I say even though on the surface because the general public does not often take the time to look below the surface. They are occupied with their own interests. In other words they became price-conscious.

A specific instance of this changed attitude became manifested in Colorado in 1933, when an assault on our college prerequisite law was launched. A bill was introduced suspending its operation for a period of two years, and in spite of the opposition of a great many pharmacists of the State it was passed by the General Assembly, fortunately, our Chief Executive, Governor Ed C. Johnson, realized that signing such a bill would be a most reactionary and backward step and vetoed it. Should any effort be made in other states to destroy our prerequisite laws it is my opinion that this ASSOCIATION should take a leading part in attempting to retain them.

Fortunately, I believe that the trend, which I have described, is again changing. The pendulum is swinging in the other direction. With the collapse of our economic structure in the past few years, the public is gradually becoming aware of the fact that the mass merchandising idea has deprived hundreds of thousands of our citizens of the opportunity of making a living. Individual businesses and professions are once again coming into their own. This great ASSOCIATION will have a large part in restoring professional pharmacy to its former high status. To accomplish this, however, the mistakes made in the past must be kept in mind. When the time comes that our colleges of pharmacy throughout this country equip their men with practical courses in commercial pharmacy rather than forcing them into the employ of our large pharmaceutical houses and the chain stores, we will know that we are back where we belong, operating our various businesses as service institutions for our various neighborhoods, and taking a just pride in our relationship with the public and our physicians.

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#### DRAMATIZING CHEMICAL INDUSTRY

Depicting the progress of chemical industry and dramatizing the part that the "invisible science" plays in every day life, 21 manufacturing divisions of the E. I. du Pont de Nemours & Co., Inc., will show their products and indicate the processes by which they are produced at the Eastern States Exposition in Springfield, Mass., from September 15th to 21st, inclusive.

The exhibit, "The March of Chemistry," will occupy 356 running feet in the Exposition's three acre Industrial Arts Building and will be the largest single display ever presented at an annual exhibition. It will be of educational nature and will cover a wide range of chemical products, including several spectacular new developments of du Pont research laboratories, showing how they are made, how they are used and how they serve, often in an unseen way the ultimate consumer.

Pharmaceutical manufacturing is depicted by dioramas in the Smithsonian Institution—see January JOURNAL A. P. H. A. pages 40-46.

# PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council

—Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By Law to conflict with the Constitution or By-Laws of this Association "

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates "

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter *Please advise us of changes in Roster and mail reports promptly*

## BALTIMORE

The regular monthly meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on January 31st at the Emerson Hotel President William F Reindollar calling the meeting to order This being the last meeting of the year, reports from the several committees were presented and after general discussion were approved and accepted

We are very much gratified that, after the embarrassing announcement in the December issue of the A PH A JOURNAL of the possibility of having to dissolve the Baltimore Branch the membership overwhelmed the committee to such an extent that by the votes received by mail and the sentiments voiced by those present such an untimely disaster was prevented Drs Dunning Swain Lowrey Kantner and others spoke at length upon the subject

The report of the Nominating Committee was called for and the following were placed before the body for action *President* A N Hewing, *Vice President* Charles Austin, *Secretary Treasurer*, Mrs E Grace Kahler and were unanimously elected by vote After a few remarks by the incoming president the meeting was closed

The Branch held its February meeting at the Emerson Hotel on Thursday evening, the 20th A dinner preceded the meeting and had as its guest, Rowland Jones representative of the National Association of Retail Druggists of Washington, D C

After dinner and before the general evening session began the presiding officer called on several for their general views and all were gratified to know that the Baltimore Branch was to continue

The General Session called at 8 30 P M consisted of about 40 who had the pleasure of hearing Rowland Jones give a comprehensive talk on the bills which affect pharmacy and are now before Congress Afterward there were a number of questions asked and very interesting information was afforded those present

Prof M R Thompson Professor of Pharmacology of the School of Pharmacy University of Maryland spoke for a time on the Students' Auxiliary of the Maryland Pharmaceutical Association

After a rising vote of thanks to Mr Jones he was compelled to leave before the meeting closed, *Secretary Elect* Kahler asked to be excused from this duty due to other connections and Robert S Fuqua of the Pharmacy and Dispensing Division of the Johns Hopkins Hospital was proposed and elected to serve for the year 1936

No further business calling the attention of this body, the meeting adjourned with loud applause and a brighter outlook for the future

FRANK L BLACK *Acting Secretary*

## CHICAGO

The 235th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, February 18th, at the University of Illinois College of Pharmacy

Dr. Jameson, Director of Research, Eli Lilly Company, was the speaker of the evening who chose as his subject "New Biologicals." He stated that the most activity in recent years has been in the field of viruses. The smallpox virus as produced on the calf is well known, there has been no improvement until the past few years. The calf virus has certain inherent disadvantages, such as occasional severe reactions, large scars many times formed as a result of the vaccination, post-vaccinal encephalitis and contamination with other viruses.

The work tended toward a virus free from these objections, particularly toward a vaccine virus free from other viruses. It was found that a sterile virus could be grown on embryonic tissue and that it could be produced aseptically and virile. There are two objections to embryonic growth of the virus in the test-tube, (1) Lack of stability and (2) Loss of virulence. The virus grown in this manner is not suitable for scarification, but would have to be administered intradermally. More information on results obtained from intradermal administration is needed.

It was found that the virus grew well on the embryonic membrane of the egg. The virus was passed through the shell of the egg into the fetal membrane and the small opening made was sealed with paraffin. The virus grows well and is of high potency. It was found that the individual responded well to this vaccination and that the virus was the same in all respects as that grown on the calf.

Some of the advantages of the egg grown virus are

- (1) Sterility
- (2) Egg has ability to destroy other bacteria
- (3) Produces a non irritating virus with no metabolites or degradation products
- (4) Reaction is much milder, the scars very small
- (5) Immunity same as with the calf vaccine

In order to have a successful take with this vaccine there must be a proliferation of cells at the point of vaccination. The vaccination must be done carefully and requires more punctures. The calf grown virus sets up the local irritation that must be artificially produced when the egg-grown virus is used.

The success of the smallpox vaccine grown in the egg has led to attempts to growing other viruses in the same manner. Chicken pox virus was mentioned as having been successfully grown in this manner.

Poliomyelitis virus obtained by the use of convalescent serum has been of little value in the treatment of this disease and is considered of no more value than normal horse serum. Sodium ricinoleate and formaldehyde have been used to attenuate the virus with but little success.

Common cold and influenza viruses have been under intensive investigation with mediocre results. There are many strains of each and the immunity is generally short lived. There seems to be fewer strains of influenza virus than cold virus. The secondary invaders of common colds usually do more harm than the cold itself. Oral cold vaccination is accomplished by growing the virus, drying, incorporating in starch and placing into capsules for oral use. It is standardized as to bacterial count. This method of virus ingestion has led to a 70% reduction in colds with a series of test cases involving 500 individuals. In these test cases it was noticed that the individuals having the most colds in a year, three to ten colds, received the greatest benefit.

The question of the feasibility of oral vaccination has received much discussion. If oral vaccination can be accomplished why do we not vaccinate ourselves during normal life? Dr. Arnold, of the University of Illinois College of Medicine, has answered this question quite satisfactorily by pointing out that organisms are not bile resistant. So, for oral vaccination the organism must be protected against the action of the bile and this is easily accomplished in the laboratory. The vaccine must be taken while the stomach is resting. Oral Cold Vaccine, Oral Typhoid Vaccine and Oral Typhoid Mixed are now available.

Pertussis vaccine has undergone much improvement in the last few years. Dr. Sauer used cultures recently isolated, grew them on human blood and used a greater bacterial count and a greater volume, about double that of most investigators. Kreuger used undenatured bacterial



antigens with the thought that denaturing vaccines were destroying the immunity-producing substances Krueger accomplished this by mechanically disrupting the organism thus producing greater solution of the bacterial protein His vaccines are standardized as to protein content and not on bacterial count

Diphtheria toxoid was formerly given in two doses but by treating with alum the proteins are precipitated and now one dose is sufficient Animal experiments show that the alum toxoid does not give as permanent an immunity, and experiments are under way on a large scale at the present time to attempt to answer this question

Tetanus toxoid (Alum precipitated) It was recommended by Dr Jamieson that the tetanus toxoid be given in two doses, a few months apart, and that an added dose be given at the time of injury

Staphylococcus toxoid can produce a high type of immunity but a large number of doses over some length of time is necessary

*Antitoxins and Serums*—The antitoxins have been improved by reducing the volume as much as 40% Other refinements and improvements have been made The protein content is reduced and the incidence of serum reactions has correspondingly decreased

Pneumonia treatment has not been as successful A better understanding of the makeup of the organisms is needed Three antibodies are known Dr Jamieson suggested research on the products given off by the organisms rather than on the many types of pneumococcic organisms

Dr Jamieson concluded with the statement that much has been accomplished in the field discussed and that much still remains to be done

The many questions asked of Dr Jamieson after the conclusion of his talk testified to the interest taken by the audiences

LAWRENCE TEMPLETON, *Secretary*

## NEW YORK

The February meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in Columbia University College of Pharmacy 115 West 68th Street, New York City, on February 10th About fifty members and their guests attended

The meeting was called to order by President Schaefer The minutes of the previous meeting were read and approved

Chairman Lehman of the Committee on Legislation and Education presented the following report

*Federal Legislation* *National Fair Trade Act S 3518*, introduced by Senator Radcliffe of Maryland for Senator Tydings and sponsored by the N A R D amends the Sherman and Federal Trade Commission Acts so as to permit those engaged in interstate commerce and located outside of a state having a price maintenance law without being liable for illegal restraint of interstate commerce or unfair competition

*Anti Discrimination Bill*—Senator VanNuys, of Indiana, has introduced S 3835 which imposes a fine of not more than \$5000 00 or imprisonment of not more than one year or both for any person engaged in commerce to knowingly discriminate against competitors of a purchaser by granting any discount, rebate or allowance over and above any discount, rebate or allowance available to competitors, or to sell goods in any part of the United States at prices lower than those exacted by said person elsewhere in the United States for the purpose of destroying competition or eliminating a competitor

*Sales Below Cost*—Again the Federal Trade Commission has been asked to approve a rule having the force and effect of law prohibiting the "selling of goods below cost with the intent and with the effect of injuring a competitor, and where the effect may be to substantially lessen competition or tend to create a monopoly or to unreasonably restrain trade, cost being determined by including all elements recognizable as good accounting practices"

*Toilet Article Tax Repeal*—H R 9867, recently introduced by Representative McCormack of Massachusetts repeals the 10% tax on perfumes, essences toilet waters, cosmetics, petroleum jellies, hair oils pomades hairdressings, hair restoratives toilet powders and similar preparations, and the 5% tax on tooth and mouth washes dentifrices tooth pastes and toilet soaps

*Ten Cent Toilet Articles Exempted*—H R 10134 introduced by Representative Owen of

Georgia, amends the Revenue Act of 1932 by providing that the 10% tax on toilet articles shall not apply to "articles retailing at 10¢ or less exclusive of any State sales tax"

*Payroll Records*—Manufacturers, wholesalers and retailers who do not employ eight or more persons must keep records, beginning January 1, 1936, to show that they are not employers under the Federal Security Act and not subject to the tax imposed under the act

*The Decision of the Court of Appeals in the Matter of the New York State Fair Trade Act*—It is the intention of the Committee on Fair Trade of the New York State Pharmaceutical Association to exert every legal effort to induce manufacturers of nationally advertised pharmaceutical and cosmetic preparations to stabilize resale prices on their products

The Court of Appeals merely declared unconstitutional that section of the law which bound non signatories to the terms of the contracts between manufacturers and retailers

The Court in the opinion of the Committee distinctly upheld the right of a manufacturer to enter into resale price contracts with wholesalers and with retailers The right of a manufacturer to adopt a refusal to sell policy was also upheld

The Committee on Fair Trade asks all to sign contracts when the same are submitted and approved by the Committee

The Committee on Legislation of the N Y State Pharmaceutical Association will introduce the following legislation

1 A bill to prohibit manufacturers and wholesalers from selling poisonous deleterious and habit forming drugs to non-licensed stores

2 A bill to empower the State Board of Pharmacy to revoke a pharmacist's license for unethical conduct

3 A bill to empower the State Board of Pharmacy to control and limit the opening of new pharmacies

4 A bill to strengthen the Fair Trade Act

5 A bill to prohibit the sale of any commodity below the manufacturer's list price in dozen quantities or smaller units, plus overhead, which latter shall be defined to include wages, salaries, light, rent, insurance, interest on loans, taxes, licenses, advertising expenses etc, not to be considered at less than 15% at any time

6 A bill to give the State Board of Pharmacy control over the manufacture and sale of all proprietary medicines

Chairman Hauck, of the Committee on Membership, reported that he plans to circularize the professional pharmacies in New York City in an endeavor to gain new members for both the parent organization and the Branch He also reported that he intended to send letters to all members of the graduating classes in the pharmacy colleges of New York City, this year, hoping thereby to gain many new members

Under new business a telegram was read from the Legislative Committee of the N Y State Pharmaceutical Association, requesting that telegrams be sent to Senators Copeland and Wagner demanding early passage of Bill S 3154 A second telegram was from the same Committee and requested members to send telegrams or letters to Melvin Eaton of Norwich, N Y, Republican Leader of the State, protesting against the bills introduced in the Senate which would repeal the Feld Crawford Law (Fair Trade Act)

A letter was received from President Henry J Wildhack of the New York State Pharmaceutical Association, explaining that he intended to appoint an Auxiliary Trade Committee to check up as to whether or not manufacturers and wholesalers are enforcing their resale price contracts The auxiliary members are to act as contact men between Branch Associations and the Fair Trade Committee The president was requested to appoint three members from our Branch to this committee

President Schaefer then called upon Chairman Steiger, of the Committee on the Progress of Pharmacy, for his report which is as follows

*Science News Letter Reports*—Quick relief for *Angina Pectoris* by inhalation of trichloroethylene homologue of chloroform, was described in paper by Dr John C Krantz, Jr, at the meeting of the A A A S At the same meeting Dr James C Munch told of the permanent relief of *Angina* by treatment with an extract of the pancreas from which Insulin has been removed

According to Dr Walter R Miles, of Yale, drugs that are good for weak individuals may have an entirely opposite effect on those in good health

Doctors Tamura and Boyd, of the University of Cincinnati, report a new way of making vaccines for immunization against diseases for which there are at present no safe vaccines. Instead of killing the specific culture by heat to make the vaccine, these investigators treat it with ketene.

Drs Stanley and Loring publish further discoveries of their crystalline virus of tobacco mosaic. From tomato plants suffering from mosaic disease they isolated the same crystalline compound as that causing tobacco mosaic. Dr Stanley's investigations show that the cause of this one virus disease is not a living substance but a non living chemical. It may be that the agents which cause other virus diseases are also non-living chemical substances. If this proves to be the case it will provide an entirely new line of attack on a wide group of diseases that afflict animals and man.

*From Oil Paint & Drug Reporter*—On January 31st the Philadelphia College of Pharmacy dedicated the new Remington Memorial Laboratory, the installation and equipment were made possible by gifts of Eli Lilly & Co.

*Drug Trade News*—Allergic complaints such as asthma and hay fever, were traced to a condition diametrically opposite to that of diabetes, according to Dr H B Wilmer of Abington Memorial Hospital. He stated that allergic patients have a high sugar tolerance resulting from an insufficient secretion from the cortex of the suprarenal gland.

President Schaefer then introduced Ralph R. Foran, Chief Chemist, Merck & Co., Inc. the speaker of the evening, who discussed Pharmaceutical Chemicals their purchase preservation and use. An abstract of Mr Foran's speech follows.

'In buying chemicals for use in the pharmacy the pharmacist should give some thought to the manner of their intended use, their proper form, purity, their keeping qualities, proper packaging and all other considerations which are pertinent, all to the end that he may have the type and quality of goods best suited for the purpose in mind.

'Many solid chemicals are available in a variety of forms and qualities and many liquid chemicals are available in several strengths. He may by judicious selection, not only save money, but use his chemicals to better advantage in making up prescriptions or preparations or for other purposes. Sodium carbonate, for instance, is available in ten different varieties of grades and forms, each one of distinctive quality and form.

Other examples of chemicals which may be had in different forms and quality specifications are acetylsalicylic acid, boric acid, salicylic acid, sodium salicylate, dibasic sodium phosphate, acetanilid, iron and ammonium citrate, potassium bicarbonate, potassium chlorate, zinc sulphate, magnesium sulphate, sodium and potassium hydroxide, potassium iodide, zinc oxide and so forth. Among the liquid chemicals hydriodic acid, acetic acid and phosphoric acid may be mentioned as being obtainable in several strengths.

"In order that chemicals may be adequately preserved the precautions given in the U S Pharmacopœia, the National Formulary and other books should be followed. Factors which influence the deterioration of chemicals are heat, cold, moisture, light, air (oxidation) or combination of these. Sometimes, in spite of all precautions, chemicals will spoil and we can only attribute this to 'the perversity of inanimate objects'.

'While the chemical characteristics of most chemicals are well known and recorded in the literature there are variables as to many of the physical properties and the pharmacist would do well to acquaint himself with these possible variations all to the end that he may best serve himself and his customers."

Following general discussion the speaker was accorded a rising vote of thanks.

HORACE T. F. GIVENS, *Secretary*

## PHILADELPHIA

The February meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Club Room of Mitten Hall, Temple University, February 18, 1936. President MacLaughlin called the meeting to order. The minutes of the January meeting were read and approved. Dr Robert P. Fischelis, past-president of the parent body, was introduced as a guest.

Dr James C Munch presented the names of three applicants for membership in the Branch, they were duly elected The new members are George W MacFarland Bernard Melkon and Charles Kohler

Under new business President MacLaughlin appointed the following Committee on Nominations to report during the March meeting *Chairman*, James C Munch, *Adley B Nichols* and *Frank H Eby*

The meeting was then turned over to Dr James C Munch, who officiated as chairman of a Symposium on Research and Scientific Papers presented by members of Temple University The speakers and their subjects were

Professor Frank H Eby, on, "Stramonium" Dr Thomas M Logan, "Preservation of Canned Foods," Prof Harry M Mantz, "Investigations on Cannabis," Walter C Dietrich "Results of Saliva Tests on Animals," Dr James C Munch "Taste Tests"

Thanks were expressed to William Salus, of Williams, Brown and Earle, for securing and operating the motion picture machine

GEORGE E BYERS *Secretary*

#### MARCH

The March meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, was held at the Philadelphia College of Pharmacy and Science, Tuesday evening March 10th, and called to order by President MacLaughlin Reading of the minutes of the February meeting was waived The treasurer's report was submitted with a certificate of audit, as rendered by Prof Frank H Eby The report, as of March 2, 1936 showed a balance of \$167 77 in the checking account and \$49 22 in the special savings account A motion to accept the report was made and passed

The following applications for membership in the Philadelphia Branch was made by Chairman James C Munch, of the membership committee, J Bruce Fegan, Mrs John Sabatino John Sabatino The applicants were voted upon and duly admitted to the Local Branch

The official speaker of the evening, Prof William J Stoneback, was then presented He chose as his subject "Firearms" He discussed and illustrated the various type pistols—their efficiency, safety and how to keep them in good working order He pointed out that under the Withins act, all type pistols had to be registered, and in Pennsylvania, a permit had to be obtained to purchase and carry one The Local Branch members were pleased with the fine dissertation and proceeded to show their interest by frequently questioning the speaker who very capably answered same

Mr Hunsberger, entertained a motion, which was duly seconded, that the members give the speaker a rising vote of thanks for his presentation

President MacLaughlin expressed his appreciation for the honor accorded him and the co operation given him by the Branch members during his term of office

The nominating committee was called upon for its report The committee consisted of Chairman J C Munch, A B Nichols and F H Eby The chairman read the report as follows *President*, Lawrence L Miller, *First Vice President*, H Evert Kendig, *Second Vice President*, S H Kerhn, *Secretary Treasurer*, George E Byers, *Delegate to the House of Delegates*, A Ph A, Ambrose Hunsberger

The report was accepted and as there were no further nominations the President asked Chairman Munch to cast a unanimous ballot for the nominees, thereupon they were declared elected officers for the ensuing year The newly elected officers were installed

Preceding the meeting the members assembled in the reception room of the college for the annual past-presidents dinner Nineteen members and guests were present

GEORGE E BYERS *Secretary*

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#### NOT NECESSARILY SPINACH

Please note that "green vegetables" need not mean spinach Spinach is by no means in a class by itself as a vegetable rich in vitamin A value In tests thus far available escarole, kale and parsley have shown higher vitamin A values than spinach, other dark green leaf vegetables such as beet greens chard, dandelion and turnip tops rank about with spinach in this respect (It is time for the science of nutrition to throw off the incubus of too close an identification with spinach)—SHERMAN, H C, *Food and Health*, New York, Macmillan Company, 1934

## THINGS TO BE CONSIDERED IN PROMOTING THE USE OF OFFICIAL PRODUCTS \*

BY MARVIN J. ANDREWS<sup>1</sup>

For the past several years there has been a great amount of enthusiasm in promoting the use of the drugs and preparations contained in the United States Pharmacopœia and the National Formulary. The actual methods used by the various city county state or national pharmaceutical associations vary a great deal, some have been successful while others have proven a total failure. With all of these methods, the real theoretical object back of this publicity is to induce the practicing physician dentist or veterinarian to write more prescriptions, which in turn will give the pharmacists an opportunity to actually practice their chosen profession.

The various methods used in publicising the products of the United States Pharmacopœia and the National Formulary may be classified roughly into two general classes namely, (1) Publicity based on price alone and (2) Publicity based on a well outlined educational plan. There are many different methods that may be followed under each of the two general classes and the object of this paper is to point out a few of the many things to be considered in adopting either of the two above mentioned plans.

It is necessary for the Committee in charge of this work to thoroughly discuss the various plans of promoting the use of the official products, then to adopt a definite program to follow and continue this program over a sufficient length of time to be worth the effort required. With this portion of the program definitely settled the next step is to determine the best method of financing the proposed plan. This alone is a task unless the ASSOCIATION or the individual has sufficient funds in bank to spend for this definite purpose.

## METHODS OF FINANCING PROGRAM

The method of raising funds to carry on the promotion of the use of official products may be conducted as follows. (1) Have the association or associations promoting the work appropriate a definite sum of money to be spent during the year. (2) In case the funds are low in the ASSOCIATION Treasury the next best method is to make an appeal to the retail pharmacists in the city or state in which the publicity is to be carried on. The method of appeal will vary in different localities. The program outlined below is the method used in Maryland during the year 1934-1935.

The U S P and N F Publicity Committee outlined the method to be followed in collecting the necessary funds and published this outline in the space regularly allotted to this Committee in the *Maryland Pharmacist* which goes to every drug store throughout the State each month. When this was in the hands of the pharmacists the invoices of each of the large wholesale drug gists throughout Maryland were stamped for a period of ten days as follows: "Have you contributed to the U S P and N F Publicity Fund? If not, please mail \$1.00 to Charles S. Austin, Jr., 3036 Abell Ave. Baltimore. Follow work in *Maryland Pharmacist*." After using the rubber stamp on the invoices for four days a letter explaining the work of the Committee and the results obtained to date was mailed to all that had not contributed as of that date. At the end of ten days, those that had not contributed were visited by a member of the U S P and N F Maintenance Committee. The results of this campaign were quite satisfactory. The Associations have decided to add one dollar to the annual dues of the members to finance the work for the coming year.

## PUBLICITY BASED ON PRICE ALONE

When the publicity material is based on price alone it is necessary to make a comparison with some unofficial products. This is usually accomplished by making a list of the unofficial products corresponding to the official product giving the net cost price of each. It is true that this is quite a contrast, yet in so doing the Committee is subjecting themselves to severe criticism since the same ratio is not carried out in the selling price. If possible it would be better to make a comparison of the selling price rather than the net cost. However this is practically impossible as the selling price of the article will vary with the individual pharmacist.

\* Section on Education and Legislation. AMERICAN PHARMACEUTICAL ASSOCIATION, Portland meeting, 1935.

<sup>1</sup> Assistant Professor of Pharmacy School of Pharmacy University of Maryland.

A better method to use when the publicity is to be based on price alone is to take some drug or preparation as a unit. Then calculate the price of the other items in terms of the unit without mentioning the price in any instance. The following will serve as an example.

Name of Article	Price in Small Units	Bulk Prices
Article A	1 5	1 0 (unit)
Article B	5 0	4 0
Article C	1 2	0 8

Using the above illustration, you have not disclosed to the other professions the actual cost or selling price of any of the articles mentioned, which surely is the better method of the two.

The objections to a plan, basing the publicity on price alone are many. The three outstanding objections are: (1) The Committee is trying to sell the products on price alone. (2) It is necessary to condemn the products of reputable manufacturers in carrying out this type of program. This in turn results in a "mud-slinging" campaign at the end of which the profession of pharmacy has taken several more steps toward the cellar. (3) There is a tendency in people to believe that the value obtained is in proportion to the price they have paid.

In the estimation of the author this type of program can have but a very limited success as there is only a small number of items that can be compared, while a publicity plan based on a well outlined educational program has unlimited possibilities.

#### PUBLICITY BASED ON A WELL-OUTLINED EDUCATIONAL PLAN

A Committee that bases its program on a well outlined educational plan does not have to worry about the quality of the drugs and preparations contained in the United States Pharmacopoeia and the National Formulary, as these two books are recognized by the Federal Pure Food and Drugs Act and by the laws of the various States as the legal standards for drugs and preparations in this country. With this recognition as a start the Committee has many talking points on why a practicing physician, dentist or veterinarian should prescribe these products wherever possible.

The average young practitioner of today is not taught in the medical schools how to write an intelligent prescription. Neither do they learn much about prescribing while serving their internships in the various hospitals. As a result, when they open their own offices they know very little, or nothing, about the art of prescribing and usually use some prescriptions they have obtained from their physician friends or from some salesman. Knowing this there are any number of ways in which the pharmacist can suggest the use of the official products and show how the simple drugs can be compounded into intelligent prescriptions. In doing this it is necessary to bear in mind certain fundamental principles such as solubility, incompatibilities, the nature of the drug to be prescribed, etc.

In sending the suggested prescriptions to members of the other professions definite policies should be established before the work is started, such as: (1) Whether the prescriptions are to be written in the official Latin, abbreviated Latin or in English. Of the three above mentioned the author, personally, prefers the use of abbreviated Latin, as the full Latin endings are difficult to remember and English is too easily read by the patient. (2) Whether the quantities of the ingredients are to be given in the Apothecary or Metric system. When the Committee is sending out this information to a large number of physicians the method of giving the quantities in the Apothecary system in one column and those in the Metric system in a corresponding column to the right is to be preferred.

The suggested prescriptions that are to be included on the index cards, pamphlets or booklets should all be compounded and allowed to stand for a period of time equivalent to the time it would require the patient to consume the contents of the prescription. If this procedure is followed the Committee will soon find that all prescriptions calling for only U S P and N F preparations are not always a credit to pharmacy, and many changes in formulas will necessarily be made.

Each bulletin sent to members of other professions should be practicable and at the same time present a definite message. This message may be presented in various ways as: (1) by grouping prescriptions of a definite type under one heading such as (a) "General Tonics, Stomachics,

# ASSOCIATION BUSINESS

## AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1935-1936

Office of the Secretary, 2215 Constitution Ave , Washington, D C

### LETTER NO 13

February 19, 1936

*To the Members of the Council*

90 *Use of Text of N F VI* Motion No 38 (Council Letter No 12, page 178) has been carried and Dr Goodman, the Tennessee School of Pharmacy and Professor Fiero have been so advised

The following communication has been received from Chairman DuMez of the Committee on Publications

' I have looked over the sample pages of the manuscript of the Handbook of Accepted Remedies, Symptoms and Treatment of Poisoning Diagnostic Procedures and Miscellaneous Information to be published by the Department of Public Health of San Francisco for use as an official guide by the institutions of that department In view of the very limited use of the National Formulary test I am recommending that permission be granted and that no fee be charged So far as I can determine from the pages submitted practically the only use which will be made of the text of the N F will be to include the titles of certain N F preparations '

(*Motion No 40*) It is moved by DuMez that the Department of Public Health of San Francisco be granted permission to partially reproduce the text of the N F VI in the Handbook of Accepted Remedies, Symptoms and Treatment of Poisoning Diagnostic Procedures and Miscellaneous Information to be published for use as an official guide by the institutions of that department, under the usual conditions and without charge

91 *Election of Members* Motion No 39 (Council Letter No 12, page 179) has been carried and applicants for membership numbered 174 to 201, inclusive, are declared elected

92 *Contract for Printing Binding and Distributing the Year Book, Volume 23* A communication has been received from Chairman DuMez advising that the Committee on Publications has received bids from the firms that have heretofore been invited to submit them He writes I have checked over these estimates carefully—and am recommending that the contract for the manufacture and distribution of the YEAR BOOK of the AMERICAN PHARMACEUTICAL ASSOCIATION be again awarded to the Lord Baltimore Press Baltimore Md on the basis of the quotation submitted on January 10, 1936 "

(*Motion No 41*) It is moved by DuMez that the contract for printing, binding and distributing the YEAR BOOK Volume 23, be awarded to the Lord Baltimore Press, Baltimore Md on the basis of their bid of January 10, 1936

93 *Louisville College of Pharmacy Student Branch* The following application has been received together with the applications for membership and the dues for 1936

"The undersigned students of the Course in Pharmacy of the Louisville College of Pharmacy desire to establish a Student Branch at the College and petition the Council of the ASSOCIATION to approve the formation of the Branch and its Preamble and By-Laws as submitted herewith

Joe Black

Claude M Lloyd

Horace E Hannon

John M Burton

Wm Walsh Jr

Fred P Kranz, Jr

Sister Crescentia

Hal Aufi

Edward E Krebs

Jack W Dorsey

J P Forgy

Henry J Zurlage

James Burgess

Sister Anne

Sister Margaret Ann

Student Advisor Gordon L Curry Dean '

*The Preamble and By Laws are as follows*

"In order to stimulate a greater professional and scientific interest in the students at the Louisville College of Pharmacy in the City of Louisville, and vicinities, we the undersigned do hereby resolve to constitute ourselves into a student branch of the AMERICAN PHARMACEUTICAL ASSOCIATION for the purpose of advancing the objects for which the body was founded. The branch hereby adopts for its guidance the Constitution and By-Laws of the AMERICAN PHARMACEUTICAL ASSOCIATION, and its members hereby subscribe to them.

"ARTICLE I *Members* This Branch shall consist of active and associate members.

"ARTICLE II *Active Members* All members of the Louisville College of Pharmacy Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION shall be members regularly enrolled in Pharmacy in the Louisville College of Pharmacy on signifying their intention of adhering to the provisions enumerated in the Preamble and in the Constitution of the AMERICAN PHARMACEUTICAL ASSOCIATION, shall be elected to active membership in this branch.

"ARTICLE III *Associate Members* Any person who is not an active member, but who manifests his interest either by contribution or active participation of work or research scientific papers, or adds to its financial resources, shall be termed an associate member but without the right to vote.

"ARTICLE IV *Officers* The officers of the Branch shall be a President, Vice President, Secretary and Treasurer.

"ARTICLE V *Committees* At the first January meeting of each fiscal year or as soon thereafter as possible, the President shall appoint three standing committees as follows: A Committee on Program, to consist of three members, a Committee on Student Activities to consist of three members, and a Committee on Membership to consist of three members.

"ARTICLE VI *Executive Committee* The officers of the Branch and the chairman of the Standing Committees shall constitute the Executive Committee, to transact all the necessary business usually transacted by such a committee.

"ARTICLE VII *Meetings* The meetings of the Branch shall be held at least once a month and as many more times as might seem advisable from the opening date of school each year to the close. Date of the meeting to be selected by the officers of the Branch.

"ARTICLE VIII *Quorum* Seven members shall constitute a quorum.

"ARTICLE IX *Fiscal Year* The fiscal year of the Branch shall be from the first of January until the first day of January of the following year.

"ARTICLE X *Elections* The officers shall be elected by ballot by a majority at the last meeting held in December and shall be installed at the first meeting held in January, and shall serve for one year or until their successors have been elected. Nominations for officers shall be made at a meeting previous to the meeting at which the election is held.

"ARTICLE XI *Presiding Officers* In the absence of the president, the next succeeding officer shall take the chair.

"ARTICLE XII *Secretary* The secretary shall keep fair and correct minutes of the proceedings of the meetings and send reports of the same to the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION as often as is required, and to such journals and newspapers as he may deem proper. He shall preserve on file, all reports and papers of every description presented to the Branch, and shall be charged with the necessary business and scientific correspondence. He shall read all papers handed to him by the President for the purpose, shall call and record ayes and nays, whenever they are required to be called, shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues and stating the business upon which the committee is to act. He shall notify every member at least one week in advance of the time and place of the meeting.

"ARTICLE XIII *Treasurer* The Treasurer shall collect and take charge of the funds of the Branch and shall give receipts for the same. He shall pay no money except upon the order of the secretary countersigned by the president and accompanied by the proper vouchers. He shall present a statement of conditions at each December meeting of the Branch. He shall receive the amount of his expenses incident to the duties of his office.

"ARTICLE XIV *Order of Business* (1) Reading of the minutes of the previous stated meeting, (2) Introduction of newly elected members, (3) Unfinished or deferred business, (4) New business, (5) Program, (6) Nominations and elections, (7) Adjournment.

"ARTICLE XV *Miscellaneous* Every proposition to alter and amend these By-Laws



shall be submitted in writing at a stated meeting of the Branch and may be balloted for at any subsequent stated meeting, when upon receiving the votes of three-fourths of the members present it shall become a part of the By-Laws

'ARTICLE XVI *Rules of Order* On all points not specifically mentioned in the By Laws governing this section, the By Laws of the AMERICAN PHARMACEUTICAL ASSOCIATION shall take precedence over the other decisions on parliamentary rule "

(*Motion No 42*) It is moved by Kelly that the application to establish a Student Branch in the Louisville College of Pharmacy and the proposed Preamble and By-Laws of the Branch be approved

94 *Applicants for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received

No 202 Charles Kohler 205 Clividen Ave, Glenside, Penna, No 203, Eugene A Nyiri 40 Wakeman Ave, Newark N J No 204 Charles Nichols 860 S 16th St, Newark N J No 205, Victor E Feit 480 S Snelling Ave, St Paul Minn, No 206, Robert Wallis Duncan 431 Daly Ave, Missoula Mont, No 207, Esther Madden Box 485 College Sta, Pullman Wash No 208 George Sonoda, 1325 E 99th St, Los Angeles Calif, No 209, John R Emerich, 1286 E 188th St, Cleveland Ohio, No 210, Bernard Melkon Phila College of Pharm and Science Phila Pa, No 211 Nathan Zomies, 1418 Walnut St, Philadelphia, Pa, No 212 F C Grein P O Box 1048, El Paso Texas, No 213 John Claude Sutton, Wm Beaumont General Hospital El Paso, Texas, No 214, Mandel Brin, 10048 Indianapolis Ave Chicago Ill, No 215, David Bisen 111-04 Roosevelt Ave Corona, N Y, No 216, George Henry Gerlach c/o Strong, Cobb & Co Cleveland Ohio, No 217 Jack Zitomer 2055-70th St Brooklyn, N Y, No 218 Bessie Burda 2801 S Springfield Ave Chicago Ill, No 219 Stanislaw Sokolowski 35 Evelyn Rd Everett Mass, No 220 Sister Anne Snow, St Joseph Infirmary, Louisville, Ky, No 221 Sister Margaret Ann Schwering St Joseph Infirmary, Louisville Ky, No 222 Claude M Lloyd Susie Ky, No 223 Joe Black College St, Franklin, Ky, No 224, Henry John Joseph Zurlage 615 S Floyd St Louisville Ky, No 225, Jack Weldon Dorsey, 42 E McClain Ave Scottsburg, Ind No 226 Joe Pearl Forgy 316 S 42nd St Louisville Ky, No 227, Frederick Philip Kranz Jr Six Mile Lane Buechel Ky, No 228 William Joseph Walsh 637 S 41st St Louisville Ky No 229 Sister Crescentia Wise St Joseph Hospital Lexington Ky, No 230 Horace Edward Hannon 3402 Bank St Louisville Ky, No 231 John Milton Burton Monticello Ky No 232 James Rawlins Burgess Oakdale Tenn, No 233 Harry Franklin Auiff 411 North College St Franklin Ky No 234, Edward Eugene Krebs, 2513 Blvd Napoleon, Louisville Ky

(*Motion No 43*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION

E F KELLY, *Secretary*

#### LETTER NO 14

March 3, 1936

*To the Members of the Council*

95 *Use of Text of the N F VI* Motion No 40 (Council Letter No 13, preceding) has been carried and the Department of Public Health of San Francisco has been advised

The following letter has been received from Professor Glenn L Jenkins 'Dr A G DuMez and the undersigned respectfully request permission to use for comment in the second edition of our textbook on 'Quantitative Pharmaceutical Chemistry' the directions given in the National Formulary VI for about six assays The nature of the use which we expect to make of the National Formulary text is similar to that made in the first edition of our book sample pages of which are enclosed "

Permission was granted in 1930 to use the text of N F V in the first edition of the book by Drs Jenkins and DuMez

(*Motion No 44*) It is moved by Kelly that Glenn L Jenkins and A G DuMez be granted permission to use the text of N F VI for partial reproduction in the second edition of their textbook on 'Quantitative Pharmaceutical Chemistry' with the usual acknowledgment and at the usual charge of \$5 00

96 *Contract for Printing Binding and Distributing the Year Book, Volume 23* Motion No 41 (Council Letter No 13 preceding) has been carried and the contract is awarded to the Lord Baltimore Press Baltimore, Md

97 *Louisville College of Pharmacy Student Branch* Motion No 42 (Council Letter No 13, preceding) has been carried and the application and the preamble and by-laws are approved

98 *Election of Members* Motion No 43 (Council Letter No 13, preceding) has been carried and applicants for membership numbered 202 to 234 are declared elected

99 *Committee on Finance* The Secretary regrets to report that Chairman W Bruce Philip has been ill for several weeks and that it will be impossible for him to act as Chairman of this Committee for some time, although he is greatly improved Mr Philip requests that some one be authorized to act in his place until further notice, especially in the approval of bills

Chairman Hilton upon request, has agreed to act for Mr Philip and the selection is approved by Treasurer Holton

(*Motion No 45*) It is moved by Kelly that S L Hilton be authorized to act as temporary Chairman of the Committee on Finance in the absence of Chairman Philip As it is necessary to make provision promptly, a vote is called for at this time but will be considered as tentative if there is objection or if members of the Council desire to submit comments

100 *Applicants for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received

No 235, Alice Marie Riordan, 2654 LaSalle Ave, Los Angeles, Calif, No 236, James B Haley, 839 1/2 W 42nd Bl Los Angeles, Calif, No 237, George A Ware 3215 W 23rd St Los Angeles Calif, No 238, F R Rogers Main & Market Sts Dayton, Tenn No 239, Dorothy M Morrison, Corbin Hall, Missoula, Mont, No 240, Grace E Huber, 42 E 31st St, Bayonne, N J, No 241, Wobert F Johnson, 143 N Water St, Decatur, Ill, No 242, William A Lavin, 225 N W 23d Ave, Portland, Ore, No 243, Samuel Louis Fox, 1200 Park Ave, Baltimore Md, No 244, Andres Sandin Cestero De Siego St No 72, Rio Piedras, P R, No 245, Melvin F Waltz, 808 Hamilton Ave, Fort Wayne, Ind No 246, W J King, 1220 Seventh Ave, East Twin Falls Idaho No 247, George Benner Kelly, 45 E Broadway Tucson Ariz, No 248 Theodore C Fields, 1127 W Saginaw St, Lansing, Mich

(*Motion No 46*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION  
E F KELLY, *Secretary*

## LETTER NO 15

March 5 1936

### *To the Members of the Council*

101 *Local Secretary Time and Headquarters for the 1936 Meeting* Mr Walter D Adams recently advised that a meeting had been held in Dallas to organize a Committee on Arrangements for the AMERICAN PHARMACEUTICAL ASSOCIATION meeting and that it had not been possible to start the work until the general plans for the Texas Centennial had been completed

Mr Adams was nominated as *Local Secretary* with Mr Sam P Harben as *General Chairman* Mr Adams and Mr Harben worked together for several years in arranging for the meetings of the Texas Pharmaceutical Association are thoroughly acquainted with the requirements and have given a great deal of their time recently to determining the best time for the meeting and to selecting the headquarters hotel

The American Association of Colleges of Pharmacy requested by resolution that the meeting be held on either the third or the fourth week in August Mr Adams writes that it will be necessary to select the fourth week as the South-West Market Season is arranged for the third week, which with the attendance at the Centennial will make that week undesirable

After an investigation of the hotel facilities Mr Adams and Mr Harben recommend that the Hotel Adolphus, the largest in Dallas and located at Commerce and Akard Sts, near the center of the business section of the city, be selected as the headquarters The hotel has 825 rooms, all with bath, and a number of large hotels are located nearby The Dallas Chamber of Commerce has pledged that accommodations will be available for all who may attend It will be necessary however, for reservations to be made promptly and this request will be given wide publicity as soon as the headquarters is approved

The room rates as quoted are \$2 50 and up, single, \$3 50 and up, double, and \$4 00 and up, twin beds Luncheons are 85¢ and up, and dinners are \$1 25 and up A la carte service is also available

Mr Adams and Mr Harben have examined the meeting room facilities and are assured that the accommodations are adequate and suitable for the purposes

(*Motion No 47*) It is moved by Kelly that Walter D Adams be elected *Local Secretary* for the 1936 meeting, that the week of August 24th to 29th be selected as the time for the meeting, and that the Hotel Adolphus be approved as the headquarters

A vote on this motion will be called for in about one week as it is necessary to reach a decision as promptly as possible

E F KELLY, *Secretary*

## NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E G Eberle, 2215 Constitution Ave, N W Washington D C

All manuscripts should be typewritten in double spacing on one side of paper 8½ x 11 inches, and should be mailed in a flat package—not rolled The original (*not carbon*) copy should be sent The original drawings, not photographs of drawings should accompany the manuscript Authors should indicate on the manuscript the approximate position of text figures All drawings should be marked with the author's name and address

A condensed title running page headline not to exceed thirty-five letters, should be given on a separate sheet and placed at the beginning of each article

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department School or College The date when received for publication should be given

Numerals are used for figures for all definite weights measurements, percentages, and degrees of temperature (for example 2 Kg 1 inch, 20.5 cc, 300° C) Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago about two and one half hours, seven times)

Standard abbreviations should be used whenever weights and measures are given in the metric system, e g 10 Kg, 2.25 cc etc The forms to be used are cc Kg, mg mm, L and M

Figures should be numbered from 1 up beginning with the text-figures (line engravings are always treated as text figures and should be designed as such) and continuing through the plates The reduction desired should be clearly indicated on the margin of the drawing All drawings should be made with India ink preferably on white tracing paper or cloth If coordinate paper is used, a blue lined paper must be chosen Usually it is desirable to ink in the large squares so that the curves can be more easily read Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches) Photographs intended for half-tone reproduction should be securely mounted with colorless paste

"Figure" should be spelled out at the beginning of a sentence elsewhere it is abbreviated to 'Fig,' per cent—2 words

The expense for a limited number of figures and plates will be borne by the JOURNAL expense for cuts in excess of this number must be defrayed by the author

References to the literature cited should be grouped at the end of the manuscript under the *References* The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses) The sequence followed in the citations should be Author's name (with initials) name of publication volume number page number and the date in parentheses Abbreviations for journals should conform to the style of *Chemical Abstracts*, published by the American Chemical Society

(1) Author, A Y, *Am J Physiol*, 79, 289 (1927)

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Editor will appreciate comments from Board of Review and Committee on Publication, members authors and others interested

# EDITORIAL NOTES

## THE FLOODS

The flood visitation, affecting many states reached the proportion of a national disaster, but the loss and suffering is apt to be forgotten after the newspapers no longer carry headlines except by those who endured loss

Speaking from former experiences and the present, manufacturers and wholesalers responded quickly and helpfully. This statement is general, so that no injustice may be done, for manufacturers have responded in the generous way which has marked former occasions. Service time and products were supplied at once for the greatly needed biologicals and other materia medica and offer to replace damaged products has been made. The wholesalers have also responded to the immediate needs of their patrons. All of this should be worded into a story deserving of the action prompted without thought of fee or reward. During times of stress, affliction and loss the close relation of the divisions of pharmacy comes into evidence and speaks for the existing fellowship. Appreciation is extended to those who gave comfort, relief and help in the hour of need.

In the stricken sections many pharmacists have suffered direct and indirect loss and they should be given more than passing encouragement. Pharmacists are always well represented among those who respond to needs.

## THE U S P VITAMIN COMMITTEE

The U S P Vitamin Committee held sessions on March 24th in Washington, Chairman E Fullerton Cook presided. Various phases of the work were presented in papers and discussions and the sessions were well attended.

## MEETING FOR DISCUSSION OF U S P AND N F

A meeting devoted to addresses and exhibits dealing with U S Pharmacopœia XI and National Formulary VI will be held at the AMERICAN INSTITUTE OF PHARMACY, April 9th, a program is being arranged. The Medical School of George Washington University and members of the Medical and Dental Faculties have been invited, also the Medical and Dental Societies of the District of Columbia.

## THE PAN-AMERICAN CONFERENCE

It is hoped to have the medical section of the Pan American Conference visit the AMERICAN INSTITUTE OF PHARMACY on April 9th.

## THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY

The federation of American Societies for Experimental Biology formed by—the American Physiological Society, the American Society of Biological Chemists, Inc., the American Society for Pharmacology and Experimental Therapeutics Inc., the American Society for Experimental Pathology—met in Washington March 25th–28th, under the auspices of the School of Medicine, George Washington University with the cooperation of the National Institute of Health and other Government and University Institutions.

A large number of papers were read and discussed.

## PURDUE DRUGGISTS' CONFERENCE

The Sixth Annual Druggists' Business Conference held under the sponsorship of the Purdue University School of Pharmacy convened March 25th–27th. Included in this three day conference were joint meetings of the business and professional groups with the Boards of Pharmacy and groups of the American Association of Colleges of Pharmacy.

Dr Howard W Haggard and Dr Morris Fishbein, editor of the *Journal of the American Medical Association*, were on the program.

Subjects which were considered and discussed included 'Reëntering the Drug Business,' 'What Shall We Do about It?' 'Marihuans,' 'Service vs Mutuals,' 'New Competition,' 'A New Lesson in Prescription Pricing,' 'What Figures Reveal' 'News from the Front,' 'The Pharmacist and the Dentist' 'The Pharmacist and the Doctor' 'The New U S P' and 'The New N F'.

E W Runyon, member of the A P H A since 1875, and his niece were recent visitors at the AMERICAN INSTITUTE OF PHARMACY.

## TOUR OF GERMAN APOTHECARIES

No more definite information has been obtained relative to the tour of the German apothecaries in this country than submitted heretofore. The Hamburg-American Line—North German Lloyd has the matter in charge. New York, Buffalo, Detroit, Chicago, Philadelphia and Washington will be visited. The party arrives in Washington Sunday, April 26th.

## PERSONAL AND NEWS ITEMS

VISITORS AT THE AMERICAN  
INSTITUTE OF PHARMACY

During the Mass Meeting of Retailers in Washington many visitors registered at the AMERICAN INSTITUTE OF PHARMACY. It is regretted that some did not register and their names are not included in the following list. The arrangement of names is in accordance with registration and not in alphabetical order. Stanley Paul Porter, Gilbert Stein, Kenneth E Bectuloff and Sidney J Brown, Pittsburgh. Leopold L Smith, Harry L Wertley Philadelphia, Henry V Dettoven, West Chester, L Paul Tweed, Downingtown. E P Swunk, A J Meier, John C Walton. E C Cameron, J W Noble, Charles T Norris. Alexander Young, Theodore Campbell Jr, Jason A Herr, Harry Swain. Harry C Zeisig, Charles T Pickett, Philadelphia, Stanley J Pater Jr, McKeesport, E L Morgan, York, Charles B Mosemann, York, Stewart G Leidich, Harrisburg, E K Romberger, Elizabethville. Wm B Goodyear, Harrisburg, B Thomas Senseman, Jr, Harrisburg. E L Steven, Elizabethville, Emmette Packer, Harrisburg, R G Heusel, Harrisburg, Nathan Zomes, Marion M Rothman, Mark W Rothman, Philadelphia.

The following from Baltimore: A R Raycraft Jr, Manuel B Wagner, R H Wagner, Milton Miller, William R Platt, Nathan Levin, Samuel H Cohen, Bertram Kamber, A N Hewing, Ada C Hewing, Bernard Laken, Irvin Myers, Arnold Travner, Harry Jacobs, Alexander Ogurick, Earl M Morris, John H Dowker, Washington.

Andrew A Krigger, Milwaukee. John F Huber, Racine, Jennings Murphy, Milwaukee. E F Rimmer, Charlotte, N C, Alfred E A Hudson, Goldsboro.

Mr and Mrs S H Lubinsky, Paterson, N J, John T Hendershot, Newton, N J, Albert W Bach, Hackettstown, N J.

The following from Tennessee: Tom C Sharp, Nashville, H K Garmany, Chattanooga, H B Moseley, Knoxville, Joe Graham, Knoxville, A S Henderson, Knoxville, R R Ferrell, Memphis, L S Elgin, Knoxville, Samuel C Davis, Nashville.

The following from Georgia: Charles H Evans, Warrenton, R Lee Olive, Augusta, W W Forte, Columbia, Z O Moore, Atlanta.

C A Waldron, Minneapolis, W C Kregel,

St Paul, J B Dargavel, Minneapolis, Ben M Cohen, Minneapolis.

Edmund R Abell, Albert Wohlers, Otto J Pelikan, Chicago, Geo A Morava, Cicero, Charles J Hauranek, Berwyn, Howard H Zorn, Springfield, Ill, L W Grisold, Woper-ville, Ill.

John F O'Brien, Rochester, N Y.

Wm D Strachan, Pawtucket, R I, James J Gill, Providence, R I, Charles F Gilson, Centredale.

Mr and Mrs C N McKelvey, Bellaire, Ohio.

The following from Colorado: C O Shawin, Fort Collins, David B Frey, Colorado Springs, Charles J Clayton, Denver, P T Stodghill, Denver, Sebastian Kletzky, Pueblo, O P Clark, Chillicothe, Mo.

*We would be pleased to add the names of others who visited the Building.*

The AMERICAN INSTITUTE OF PHARMACY recently had as a visitor Captain Johnson Saint Conservator, Wellcome Historical Medical Museum, London, England. He was well pleased with the Building and its furnishings.

Professor Henry M Burlage, University of North Carolina, has been elected national president of Rho Chi, honorary pharmaceutical society, according to results of the nation wide mail ballot recently announced. He will be installed at the annual convention to be held in Dallas, Texas.

The president elect is a native of Indiana, holds the A B degree from the University of Indiana (1919), the M A from Harvard (1921), the Ph G and B S in pharmacy from Purdue (1924) and the Ph D in pharmacy from the University of Washington (1927). He was an instructor in pharmacy at the University of Washington from 1924 to 1926, and chemist of the Oregon Board of Pharmacy and associate professor of drug analysis at Oregon State College from 1927 to 1929. He became a member of the faculty of the University of North Carolina in 1931.

Dr Edward C Rosenow, head of the Division of Experimental Bacteriology, Mayo Foundation, will give the McGure lectures at the Medical College of Virginia on the nights of April 6th and April 7th. His subjects will be *Focal Infection and Elective Localization and Streptococci in Relation to Diseases of the Nervous System*. During the day of April 7th a symposium on focal infections will be con-

ducted by the college faculty This will cover a wide range of topics

Dr Simon Flexner, who has been director of the laboratories of the Rockefeller Institute for Medical Research since its opening in 1903 has recently resigned his position at the age of 72 years

Dr Flexner was a lieutenant colonel in the Medical Corps of the U S Army during the World War, and later became a colonel and assistant surgeon general in the U S Public Health Service He has done important work in bacteriology and pathology, especially on epidemic encephalitis, and was the first to use meningococcus antitoxin

Major General Meritte W Ireland, U S Army, retired, has again been named head of the governmental unit of the Washington Community Chest General Ireland is a former Surgeon General of the Army

Mrs L L Walton, widow of former President A Ph A, donated a series of the *American Journal of Pharmacy*, bound and unbound volumes of the JOURNAL A Ph A, 16 volumes of Pennsylvania Association Proceedings, a first edition of Remington's Pharmacy, a second edition of Parrish's Pharmacy

As a memorial to the late Prof James H Breasted, who died on December 2nd, the building housing the Oriental Institute at the University of Chicago has been named 'James Henry Breasted Hall' The institute erected at a cost of \$1,500,000 00, was dedicated on December 5, 1931 Mention is made, in part because Professor Breasted was, in his earlier years, a pharmacist—a graduate in pharmacy of Chicago College of Pharmacy

Tentative plans have been announced by Attorney Samuel Shkolnik for a testimonial dinner for Professor Clyde M Snow of the University of Illinois College of Pharmacy who will be retired from active teaching in June after thirty-six years of service because of the age limit This dinner is being arranged for some time in the early part of April

Dr R L Swan, of Baltimore, Md has accepted the invitation of the North Carolina Association to address the Greensboro convention

Dr Emile Coué<sup>1</sup> the French pharmacist, is to be honored in his home city, Nancy, by a column on the base of which will be inscribed his famous formula, 'Day by day, in every way, I am getting better and better' He visited in the United States in 1923

Charles J Lynn, Vice-President and General Manager of Eli Lilly & Co, Indianapolis was injured slightly in an automobile accident February 29th Mrs Lynn who was riding with her husband, was thrown against the windshield by the collision and was severely cut about the face

*The Pharmaceutical Journal of New Zealand* of January 1, 1936, states that there is only one European pharmacy in Addis Ababa which has become famous throughout the entire northeastern part of Africa It was established about twenty years ago by a German pharmacist, Walter Zahn Mr Zahn, who was a good friend of King Menelik, found his early clientele confined entirely to the missionaries, and it was several years before he won the confidence of the natives, who preferred dealing with their own medicine men At the present time, however, his is the pharmaceutical authority, not only in Ethiopia, but also in the adjoining colonies, whose hospitals he supplies with drugs Now natives come from far and near to ask his advice

#### BROOKLYN COLLEGE OF PHARMACY

Brooklyn College of Pharmacy received its Charter on April 21, 1886, Dean W C Anderson was a member of the first graduating class and received diploma No 1 He has been a member of the faculty for forty-five years and dean since 1902 The College is affiliated with Long Island University and the present building was first occupied in February 1930

#### BOARDS AND COLLEGES OF DISTRICT NO 2

Representatives of the Boards and Colleges of Pharmacy of New York, New Jersey, Pennsylvania, Delaware Maryland, District of Columbia met in annual conference in Atlantic City, March 9th-10th President R C Wilson of the American Association of Colleges of Pharmacy attended and addressed the convention on 'Moral Standards for Applicants for Licensure'

Interesting reports were presented on board examinations The 1937 meeting will be held in New York The Atlantic Country Club entertained the group at a dinner R P Fischelis acting as toastmaster

#### TYDINGS BILL INTRODUCED IN THE HOUSE

Representative Martin Dies of Texas has introduced H R 11167 It has been referred to the Committee on the Judiciary

<sup>1</sup> Deceased 1926

## OBITUARY

## GEORGE D ROSENGARTEN

Dr George David Rosengarten, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, since 1902, died at his home in Malvern Pa February 24th, after an illness of about two years Dr Rosengarten was born in Philadelphia, February 12, 1869, the son of Harry B and Clara J (Knorr) Rosengarten In 1884 he entered for a special course at Philadelphia College of Pharmacy, in 1890 he earned his B S degree at the University of Pennsylvania and received the Ph D degree at the University of Jena in 1892, the University of Pennsylvania honored him with the Sc D degree

He engaged with Rosengarten & Sons and, in 1901, was elected Vice President and succeeded to the same office when the firm became Powers Weightman Rosengarten Co, until 1927, and a director of the successors Merck & Co He retired from active service as chemical manufacturer in 1927

For twenty years, Dr Rosengarten served as member of the Revision Committee of the United States Pharmacopœia He was president of the American Chemical Society in 1927 and the Institute of Chemical Engineers He was fellow of the American Association for the Advancement of Science of the American Institute American Philosophical Society, the Rittenhouse Club of Philadelphia and the Cosmos Club of Washington

In 1895, Dr Rosengarten married Susan E Wright of Philadelphia who survives him, also two sisters Mrs W W Atterbury and Mrs Lewis Neilson and three brothers, Adolph G Frederic and Joseph C Rosengarten

## ALBERT HARRISON BRUNDAGE

Albert Harrison Brundage, recognized authority on toxicology and public health matters died of pneumonia March 12th in Central Islip Long Island aged 74 years

Dr Brundage was born at Candor N Y, the son of Amos Brundage M D and Sarah M B In 1885 he received the degree of M D from New York University Medical College, Ph G from Brooklyn College of Pharmacy in 1892, Pharm D in 1897 A M from University of Nashville, in 1898, M S in 1905 from Rhode Island College of Pharmacy and Allied Sciences Since 1908 he was professor emeritus of toxicology and physiology, depart-

ments of medicine, dentistry and pharmacy, Marquette University Professor of toxicology and physiology, Brooklyn College of Pharmacy 1898-1903, president of the latter 1893-1894 Toxicologist to Bushwick Hospital, 1904-1921, lecturer on tuberculosis for Brooklyn Committee for the Prevention of Tuberculosis and for American Red Cross from 1918 President of New York Board of Pharmacy, 1903 and Board examiner in toxicology and posology, chairman state committee on poisons Founder of first open air classes in Brooklyn public schools etc

Author 'A Manual of Toxicology,' 'Practical Points in Physiology' and frequent contributor to medical and pharmaceutical publications

## WILLIAM A DYCHE

William A Dyche who retired in 1934 after a service of 31 years as business manager of Northwestern University died February 19th aged 74 years He sold his pharmacy, about 1894 to a chain store organization, who also desired to 'buy' his name but this he would not sell Until he retired Mr Dyche was one of the leading pharmacists of Chicago and of the University and his activities were centered on the development of the latter

## ISAAC V S HILLIER

Isaac V S Hillier for fifty years active in the botanical trade, died March 8th in his home in Cranford, N J, aged 73 years

Mr Hillier was born in Jersey City He received his education in the public schools in Jersey City following which he entered the employ of his father in July 1878 He was admitted to partnership in 1882, was made secretary-treasurer in 1887 and became president, R Hillier's Son Corporation in 1924

## DR CHARLES JEAN HENRI NICOLLE

Dr Charles Jean Henri Nicolle, director of the Pasteur Institute of Tunis Tunisia since 1903, died February 28th aged 69 Dr Nicolle was born in Rouen France, studied medicine at the University of Paris and worked under the late Emile Roux at the Pasteur Institute He was made a professor at the Rouen Medical College in 1893 and in 1896 founded the bacteriology laboratory there In 1928 he received the Nobel prize in medicine for his research on typhus notably the discovery

that the disease is transmitted by lice in clothes. It was as a result of his discovery that delousing was made a part of army operations during the World War. He was noted for other important research.

#### IVAN PETROVITCH PAVLOV

Prof. Ivan Petrovitch Pavlov, famed physiologist, died in Moscow, February 27th, aged 87 years. He was educated at the University of St. Petersburg and Military Medical Academy. In 1890 he was appointed director of the department of physiology at the Institute of Experimental Medicine in St. Petersburg and in 1897 professor at the Military Medical Academy. Under the Soviet rule Pavlov received special favors from the government, many of which he

refused to accept, insisting that he would live in the same manner as other scientists. When he was 85 the government gave him a pension of 20,000 rubles a year, and a fund of a million rubles was made available for extensions of his laboratory in Leningrad. Pavlov's best known work was that on conditioned reflexes; he was many times honored for his achievements. In 1904 he received the Nobel prize in medicine for his research on the salivary glands. In 1935 he served as president of the fifteenth International Physiological Congress at its meeting in Moscow.

Pavlov visited the United States twice, first in 1923, and in 1929 as the guest of the thirteenth International Physiological Congress, which met in Boston.

## SOCIETIES AND COLLEGES

### BALTIMORE RETAIL DRUGGISTS' ASSOCIATION

The Baltimore Retail Druggists' Association held the annual dinner at Lord Baltimore Hotel, R. E. Lee Williamson presided as toastmaster. Among the speakers were U. S. Senator Millard E. Tydings and Mayor Howard W. Jackson. A feature of the banquet was the presentation of the Lawrence S. Williams Pharmacy Week Prize to Morgan and Millard.

### PUBLIC HEALTH LECTURES IN CINCINNATI

The Academy of Medicine of Cincinnati and the University of Cincinnati College of Medicine are sponsoring a series of public health addresses for the public Sunday afternoons.

#### LECTURERS ON PUBLIC HEALTH

George Washington University School of Medicine has announced the addition to the faculty of the newly established course in public health teaching of Drs. George W. McCoy, Rolla E. Dyer, Edward Francis, Charles Armstrong and Robert Olesen, all of the U. S. Public Health Service, with the title of professorial lecturer in preventive medicine.

### DEVELOPMENT OF HOSPITALS

The development of hospitals as educational institutions is introducing new problems into hospital administration and control. Occa-

sionally public hospitals are exploited as institutions for postgraduate study without any attempt to demand adequate fundamental training or certification of prerequisite knowledge of those who take the postgraduate study. Hospital administrators must determine whether or not their main educational function is education of the undergraduate, education of the intern or postgraduate training. Moreover, the rights of the patient are paramount to any educational function.—*Journal A M A* for March 7th.

### THE VIRGINIA PHARMACY SYMPOSIUM

Plans are now about complete for the Pharmacy Symposium requested at the last meeting of the Virginia Pharmaceutical Association. The dates will be May 20th and 21st. Dr. Crockett will give lectures on 'Certain Recent Advances in the Standardization of Medicinal Products,' Dr. Negus on 'What the Pharmacist Should Know about Vitamins' and 'The Essentials of  $\phi n$  That Pharmacists Should Know.' Dr. Haag's subject will be 'Dangers Incident to the Use of Certain Popular Drugs' and Dr. Miller will lecture on 'Biological Products.'

The speakers and subjects have been selected with care, and the material will be presented in a practical fashion that will be useful to practicing pharmacists everywhere. There will be no charge for the course and all pharmacists in the State, whether or not they are



alumni of the college, are cordially urged to take in any one or all of the lectures as they may desire —W F R

#### PHILADELPHIA COLLEGE CELEBRATES 115TH ANNIVERSARY

The 115th anniversary of the founding of the Philadelphia College of Pharmacy and Science was celebrated there February 24th Founders' Day A large number of alumni students and other friends were present The celebration began in the afternoon with an academic procession followed by an address by Dr John L Haney principal of the Philadelphia Central High School His topic was, 'The Alumnus and His College'

#### THE AMERICAN CHEMICAL SOCIETY

The American Chemical Society will hold its ninety first general meeting in Kansas City April 13th to 17th Among the outstanding addresses will be 'Present and Future of Organic Chemistry in America' by Dr F C Whitmore, of Pennsylvania State College, 'Physical Chemistry in Retrospect and Prospect,' by Dr Hugh S Taylor of Princeton

#### SOUTH DAKOTA ASSOCIATION

The Golden Anniversary meeting of the South Dakota Pharmaceutical Association will be held in Sioux Falls May 5th-7th An imposing list of national figures has been placed on the program This list includes among others the following names Hon Wright Patman, M C from Texas, secretary John W Dargavel, of the National Association of Retail Druggists, P H Costello President of the AMERICAN PHARMACEUTICAL ASSOCIATION and Secretary E F Kelly R L Swam Secretary of the Maryland Board of Pharmacy, Rowland Jones Jr Washington representative of the N A R D E R Serles Dean of the College of Pharmacy South Dakota State College, the Governor and other state officials

#### OFFICERS OF NEBRASKA ASSOCIATION

Nebraska elected the following officers *President* H L Bellamy Cambridge *First Vice President* J W Buswell Fairbury *Second Vice President* T H Harkness Lexington, *Third Vice President* H G Lee Omaha, *Fourth Vice-President*, Mrs Mae Dutton

McCook, *Fifth Vice President*, J D Barnes Fullerton, *Secretary*, J G McBride Lincoln, *Treasurer*, Orel Jones, Oconto

#### DRUG CHEMICAL DINNER RESERVATIONS OVER 1200

Reservations for the eleventh annual dinner of the drug chemical and allied trades held March 19th in the Waldorf-Astoria Hotel New York, exceeded 1200 Presidents and other officers of practically all of the national associations within the drug chemical and allied trade industries were present

#### OFFICERS OF NATIONAL DRUG TRADE CONFERENCE

The following officers were elected at the annual meeting of the National Drug Trade Conference *President* Carson P Frailey *Vice President* A C Taylor, *Secretary Treasurer*, Rowland Jones Jr The following were named by the respective organizations to serve on the Executive Committee with the Officers R P Fischels A G DuMez Frederick J Cullen Harry Noonan R E L Williamson and E S Newcomb

#### PLANT SCIENCE SEMINAR

Lloyd Harris has invited the Seminar to Oklahoma He has selected a camp 9 miles north of Wilburton and 40 miles east of McAlester The camp has nine stone buildings and is completely equipped Meals will be served and the rates are reasonable The camp is 220 miles from Dallas The opportunities for botanizing and for the informal meetings and round table discussions of the seminar are ideal The 'set up' couldn't be more perfect

In the next issue of the JOURNAL it is hoped to give dates highway routings and more details about the camp

#### IDAHO PHARMACEUTICAL ASSOCIATION

At a meeting of the board of directors of the Idaho Pharmaceutical Association held at Pocatello on February 8th, it was decided to hold the 1936 convention at Idaho Falls the dates being June 15th-16th Hotel Bonneville will be the headquarters hotel

Among those present at the meeting were A E Sutton Caldwell A A Walker Boise and Don S Whitehead Boise, R W Smith Mountain Home, E W Sinclair, Jerome, C C Kingsbury Twin Falls, C R Isenburg Ru-

pert, J P Halliwell, Pocatello, J Earl Evans Idaho Falls, and Secretary Elmer B Williams, of Boise Dean E O Leonard of the Idaho Institute pharmacy department, discussed his school and its problems and policies, D S Whitehead spoke on national legislation and led an open forum discussion on that subject, and A A Walker spoke on "Drugs in Drug Stores Only" and stressed the need of a Fair Trade act in Idaho and other helpful legislation

#### A D F INSURANCE COMPANY

The American Druggists' Fire Insurance Company is making preparations to celebrate its 30th anniversary during the first week of June The report at the annual meeting showed 480 fire losses from which the policy holders recovered \$165,876 66 The Company had in force on January 1st, 22,127 policies A dividend of \$3 00 per share was declared The directors and officers were reelected

## LEGAL AND LEGISLATIVE

### HEARINGS ON TYDINGS BILL

The mass meeting held in Washington by independent dealers in various activities was a great success The convention on March 4th filled Constitution Hall and among the speakers were Senators Tydings and Robinson, and a number of Congressmen, former Governor of Minnesota, J A O Preuss, and Rowland Jones acted as secretary Those who carried on the work of the convention feel that the event was an outstanding success and are much encouraged Representatives came from all sections of the country and the attendance is shown to some extent by the visitors at the AMERICAN INSTITUTE OF PHARMACY

### NARCOTIC CONTROL REVISION

The facts underlying the controversy on the Doughton Bill have been reported in the Press in the following 'In the Treasury, following a suggestion made by Secretary Henry Morgenthau, Jr, in August 1934, there was drafted a bill reorganizing the Secret Service to include under it all the law enforcement units now functioning separately under the Treasury These were to include The enforcement division of the alcohol tax unit, the intelligence division of the Bureau of Internal Revenue, the customs agency and the Bureau of Narcotics

The State department's objection was that the Bureau of Narcotics had been set up under an international treaty provided in the narcotics limitation convention of 1931 This bureau headed by Commissioner H J Anslinger, had served not only to discharge the United States' international obligation, but also as a model for similar bureaus in the 49 governments participating in the treaty, which had patterned their own organizations directly after the tremendously successful American set up, State Department attachés asserted "

' Under the narcotics bureau licensing of the medical and pharmaceutical trade in habit-forming drugs, by which the supply of all such drugs is controlled from production to distribution with minutest care, violations have been found in less than one-half of 1 per cent of the total drug output These violations have been mostly technical, such as wrong registrations, etc "

The drug trade activities were well represented at the hearing before the House Ways and Means Committee on February 28th and opposition was quite general to a change as proposed in the Bill

The following was submitted after the hearing

The Secretary of the Treasury is authorized to issue such rules, regulations and orders and take such other steps as he shall consider necessary in order to coordinate the functions of investigation detection and violations of laws hereby transferred to, conferred or imposed upon the Chief of the Secret Service Division with the functions of investigation detection and violations of narcotic laws law fully conferred or imposed upon the Commissioner of Narcotics or the Bureau of Narcotics " 'Unless this amendment is accepted all branches of the drug trade and the physicians of the country will be subject to the espionage and supervision of two thousand or more undercover agents or inspectors under the direction of the Secret Service instead of two hundred and fifty inspectors especially trained in narcotic law enforcement and conversant with pharmacists', physicians' and drug manufacturers' and wholesalers' problems' "

### COURT UPHOLDS CALIFORNIA UNFAIR PRACTICE ACT

'The act is a wholesome statute," Judge Moore said in his opinion, "It does not deprive

anyone of a natural right It bids all men in trade and in industry to live and let live It does not attempt to fix prices It merely requires each man affected not to cut his brother's throat at night or secretly to apply the lethal By its inhibitions, it declares those obligations which are ingrained in the social fabric and fixes rights that originate in the principle of mutual aid and that arise from other impulses which impel men to conserve their kind

The act is altogether valid It was adopted in the proper exercise of the legislative functions It is not a violation of the inhibition contained in either the 5th or the 14th Amendment to the Federal Constitution Neither did the state surrender its powers to enact such a measure by any other clause of that arch instrument

The act is not a restraint upon the right of contract It is only an injunction against acts which are declared thereby to be criminal The claim that freedom of contract is impaired by the act is archaic The claim made by the defendant that the items listed as constituting the cost of doing business are difficult of ascertainment does not affect the validity of the statute The legislation can prescribe a rule but it cannot find the facts —*Drug Topics*, March 9, 1936

#### THE BRANDEIS CLASSIC ON PRICE CUTTING \*

Mr Justice Brandeis exposed the myth that excessive prices result from the establishment of minimum resale prices in the following language

The position of the independent producer who establishes the price at which his own trade-marked article shall be sold to the consumer must not be confused with that of a combination or trust which controlling the market fixes the price of a staple article The independent producer is engaged in a business open to competition He establishes the price at his peril—the peril that if he sets it too high either the consumer will not buy or if the article is nevertheless popular, the high profits will invite even more competition The consumer who pays the price established by an independent producer in a competitive line does so voluntarily, he pays the price asked because he deems the article worth that price as compared with the cost of other competing

articles But when a trust fixes, through its monopoly power the price of a staple article in common use, the consumer does not pay the price voluntarily He pays under compulsion There being no competitor he must pay the price fixed by the trust or be deprived of the use of the article x x x

"America should be under no illusions as to the value or effect of price cutting It has been a most potent weapon of monopoly—a means of killing the small rival to which the great trusts have resorted most frequently It is so simple, so effective Farseeing organized capital secures by this means the cooperation of the short sighted unorganized consumer to his own undoing Thoughtless or weak, he yields to the temptation of trifling immediate gain and, selling his birthright for a mess of pottage, becomes himself an instrument of monopoly "

#### TYDINGS BILL ARGUED AT SENATE HEARING

Separate hearings were held March 13th before a sub committee of the Senate Judiciary Committee on the Tydings Dies N A R D National Fair Trade Enabling Act Senator Hatch of New Mexico is Chairman of the Committee and was assisted by Senators McGill, Kansas, Van Nuys Indiana, Borah, Idaho, and Austin of Vermont

Senator Millard Tydings of Maryland summarized by pointing out that the bill would not permit agreements among manufacturer or among distributors has no monopolist' features and no provisions for fixing definite prices is purely voluntary and permissive, and would permit ordinary manufacturers to do what powerful ones are now doing through the device of agency in maintaining resale prices He insisted that ample competition will remain

#### ALCOHOL LABELING AND PERMIT RULES EXTENDED

Both house and senate have passed a resolution (S J Res 217) extending the dates for permit and labeling requirements under the federal alcohol control act

This act prohibited selling alcoholic beverages at wholesale after March 1, 1936 except under permit from the Federal Alcohol Administration but this date has now been advanced to July 1, 1936 The act also provided that after the same date all labels on alcoholic beverages must be approved by the F A A, and this date has now been extended to August 15 1936, in the case of distilled

\* From *Maryland Pharmacist*, February 1936 Copies of complete article may be obtained from the *Maryland Pharmacist*

spirits and December 15, 1936, in the case of wine and malt beverages. The F A A has been unable to complete the preliminary work necessary for issuing permits and approving labels, but expects to have the work completed before the extended time expires.

The senate finance committee has not yet acted on H R 9185, an omnibus alcoholic beverage control act, including the Murphy amendment which would require the use of alcohol distilled from cereal grains in all products coming under the beverage alcohol or food and drug acts—*Oil Paint and Drug Reporter*

### APPROPRIATIONS BY CONGRESS

Appropriations are being considered by Congress. For the Bureau of Narcotics \$1,275,000.00 is proposed. For the United States Public Health Service, the following appropriations, among others, are proposed, \$8,000,000.00 to assist states, counties, health districts and other political subdivisions of the states in establishing and maintaining adequate public health services, including the training of personnel for state and local health work, \$1,155,160.00 for investigations of diseases and sanitation, \$64,000.00 for maintaining the National Institute of Health, \$5,870,000.00, for the pay of personnel and maintenance of hospitals, \$663,220.00 for the Division of Mental Hygiene, including the maintenance and operation of the Narcotic Farm, Lexington, Ky. The bill proposes that on and after July 1, 1936, the Narcotic Farm at Lexington, Ky., shall be known as the United States Public Health Service Hospital, Lexington, Ky.

### DISTRICT OF COLUMBIA

S 3514 has passed the Senate, proposing to regulate the manufacture, dispensing, sale and possession of narcotic drugs in the District of Columbia.

### COSMETIC TAX ON BATH SALT

Following a request from drug wholesalers in San Francisco in connection with the attempt of the Treasury Department to collect the cosmetic tax on Epsom Salt labeled as "bath salt," the National Wholesale Druggists' Association has brought the matter before the Treasury Department.

### KENTUCKY LEGISLATION

H 487 purposes to enact a new pharmacy practice act. Among other things the bill

proposes to prohibit the sale, except on the prescription of a licensed physician, dentist or veterinarian of hormones (synthetic or otherwise), barbital sulphonethylmethane (tetronal), sulphonmethane (sulphonal), diethylsulphon, diethylmethane (tetronal), carbromal, paraldehyde, chloral or chloral hydrate, chlorbutanol, all serums and antitoxins, and the following emmenagogues or abortives Tansy, pennyroyal, rue, savin, ergot and cotton root.

### CALIFORNIA FAIR TRADE ACT

On February 28th the highest court in the State declared the California Fair Trade (Badham) Act, including Section 1 $\frac{1}{2}$ , constitutional. It was the case of *Max Factor vs. Kunsman*, based on Section 1 $\frac{1}{2}$  which reads as follows:

'Section 1 $\frac{1}{2}$ . Wilfully and knowingly advertising, offering for sale or selling any commodity at less than the price stipulated in any contract entered into pursuant to the provision of Section 1 of this act, whether the person so advertising, offering for sale or selling is or is not a party to such contract, is unfair competition and is actionable at the suit of any person damaged thereby.'

Under leadership of Frank E. Mortenson the druggists of California expect to celebrate this very important decision.

### GENERAL PHARMACY REGULATIONS IN GERMANY

(1) The pharmacy is an institution of the State Health Service. Its task consists in service for the public welfare. Striving after profit must take second place to the achievement of this purpose.

(2) The pharmacist must conscientiously carry out his professional responsibilities. He must observe the legal regulations. He must maintain the honor and reputation of his profession in and out of business hours.

(3) The pharmacist must always be loyal toward fellow members of his profession. Especially must the leader of each business unit treat subordinates as professional comrades.

(4) Members of the staff must place the whole of their energy at the disposal of the pharmacy for which they work, and to guard its rights and reputation in and out of business hours. They are not to disclose any transactions of the business except in so far as they are, as members of the German Pharmaceutical Institute, required to notify offenses to higher officials.

## BOOK NOTICES AND REVIEWS

*The Structure and Composition of Foods*  
By ANDREW L. WINTON, Ph D and KATE BARBER WINTON, Ph D Volume II, "Vegetables, Legumes, Fruits," 904 pages, 303 illustrations by the authors John Wiley & Sons, Inc., New York, 1935 \$15.00

As was to be expected volume II of this important work on the chemistry and microscopy of foods is a worthy companion of the first volume which appeared in 1932. In point of organization, scope, scholarly treatment, effectiveness of illustration and pleasing typography the work is comparable to volume I. There is little need to repeat what has been said before about these characteristics.

In the past many of the outstanding botanical treatises correlating structure and composition have been devoted to medicinal plants. But whether a given article of diet is classed as food or medicine is often merely a matter of circumstance or of arbitrary definition. Consequently, the pharmacist and pharmacognosist will find in the volume under review much that is interesting and admirable. The teacher will frequently use the book for reference and for information. The technologist will find it invaluable for microscopical control. And, with a little ingenuity the retail druggist should be able to turn the volume to practical account.

As in volume I, the broader chemical relationships are reviewed in the introduction. Special mention is made of proteins which are such important constituents of the legumes. Organic acids and pectinous materials are discussed because of their occurrence in fruits. Plant pigments are given an extended treatment commensurate with their general distribution in vegetables and with recent chemical discoveries concerning them. It is interesting to note that the chemistry of the vitamins is reviewed from the standpoint of structural organic chemistry rather than from the standpoint of physiology.

For detailed treatment this volume is divided into 2 parts. Part I is devoted to the vegetables. As the author points out, a precise definition of the term vegetable is not possible. Hence certain arbitrary assignments have been made and sub groups as tomatoes, melons (which are fruits in a strict botanical sense), sweet corn, legumes (seeds) and mushrooms are included. Further groupings are made on the basis of structure, i. e. root vegetables,

leaf vegetables, flower vegetables etc. Part 2 is devoted to fruits proper. In both parts the final classification is by plant family and species. Of special interest to the pharmacist and pharmacognosist are the treatises on the mushrooms, horseradish and burdock (root vegetables), the vegetables of the lily, goose foot, mustard, parsley and composite families (leaves, bulbs, shoots, flowers) and the many legumes (seed vegetables). Among the fruits there are likewise many species of pharmaceutical interest, such as the date, fig, quince, tamarind, citrus fruits, papaya and pomegranate.

In a brief review it is impossible to describe adequately either the wealth of material or the beauty of the illustrations. The book will be highly appreciated by all who are interested in the structure and composition of plants. It should enjoy a correspondingly wide distribution.—R. E. KREMERS

*Twelve Hours of Hygiene* By F. L. MEREDITH B. Sc. M. D., professor at Tufts College, lecturer on Hygiene at Simmons College. The book contains about 400 pages including 110 illustrations. P. Blakiston & Son Co. publishers. The volume is an abridged edition of *Hygiene*, a textbook for college students and is intended for use in one hour, one semester courses in Hygiene for college freshmen.

The material has been divided as far as possible into twelve chapters: The Body and Its Functions, Medical Science and the Service of Health, Upkeep and Energy Supply, Digestion and Elimination, The Use of Energy in Activities, Byproducts of Activity and Energy, Renewal, Body Mechanism.

At the end of the volume are several appendices placed there in order not to break the continuity of the text and the purpose is to use this as an integral part of the text.

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#### "A JOLLY DRUG STORE"

On his first visit to Panama at a dance after finishing his 'duty dances,' the Prince of Wales, now King Edward, chose as his partner a pretty girl. This aroused the ire of a matron of position in the Canal Zone set, who made it a point to see that the Prince learned the girl was "an assistant in a drug store." Informed of this the prince replied:

*What a jolly drug store it must be!"*

# JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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No 5

## THE PRESIDENT, AMERICAN ASSOCIATION COLLEGES OF PHARMACY

Robert Cumming Wilson was born in Sparta, Ga., October 27, 1878, here he received his early education and graduated from Sparta High School in 1896. He entered the drug business, in 1899-1902, as an apprentice in the pharmacy of Rozier and Middlebrooks, Sparta. He moved to Athens in 1902, where the young man engaged with the Orr Drug Company for a period of three years, during which time he attended the University of Georgia. In 1905, Mr. Wilson was employed in the pharmacy of H. R. Palmer & Sons, until 1907, when he entered the School of Pharmacy of the University of the South, at Sewanee, Tenn., attending the sessions of 1907-1908, during which time the student also completed two years of work in the Medical College of the same Institution. In 1908, he received from Sewanee the degree of Graduate in Pharmacy.

The School of Pharmacy of the University of Georgia, in 1907, elected Mr. Wilson instructor and he has continuously been a member of the faculty, and since 1914, dean of the School. This year he is president of the American Association of Colleges of Pharmacy.

In 1911, Professor Wilson attended the Summer School of the Medical College of the University of Michigan, specializing in Physiological Chemistry.

He was president of Georgia Pharmaceutical Association, 1913-1914, elected Secretary-Treasurer, 1929-1935, and, thereafter, Executive Secretary. In 1933-1934, he was president of the Conference of Pharmaceutical Association Secretaries.

Dean Wilson is president of the Science Club in the University of Georgia, member of the Board of Health of Athens and of Clarke County, member of the Georgia Academy of Science, member of the Association of University Professors, of Georgia Educational Association, chairman and member of various other university, chemical and pharmaceutical organizations, member of the board of directors of the Red Cross and a trustee of the First Methodist Church of Athens.

His efforts are directed to dignify pharmacy in the minds of the people and to raise educational requirements and to stimulate the efforts of professional pharmacy.

Professor Wilson married Grace Branham Troutman, October 1911, they have three children—Troutman, Grace and Robert, Jr.

# EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave , WASHINGTON, D C

THE U S P XI AND N F VI OFFICIAL JUNE 1, 1936

PHARMACISTS have had notice of the fact that the U S Pharmacopœia XI and National Formulary VI will replace preceding editions on June 1st Preparations, therefore, are to be dispensed according to the new standards Never has there been greater evidence of cooperation among the professions and the industries in the work of revision

During 1935 many reports and other articles were published in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION The Abstracts of Changes will be helpful and therefore references to them are included in this comment See page 927 in the September JOURNAL for 1934, pages 716, 784, 787, 878, 882 and 1039 of the volume for 1935

A helpful report is that of Chairman E Fullerton Cook in the September JOURNAL, pages 796-800, and an address by him in the February number, page 157

The National Formulary has been freely discussed and the reports of Chairman E N Gathercoal will be found a helpful guide for pharmacists in shaping their work under the revised standards, the address of the Chairman before the Chicago Branch, A PH A , published in the February JOURNAL, beginning on page 151 will serve a useful purpose in this connection

The discussion by Secretary Adley Nichols in the April issue, pages 344-350, presents suggestions for pharmacists that will guide them in making physicians, pharmacists and dentists better acquainted with the Formulary

Quoting Chairman Gathercoal—"the basis of admission to the U S Pharmacopœia is the best drugs or medicines of known therapeutic value that are being used at the time of revision, while the basis for admission to the National Formulary is extent of usage, regardless of the consensus of the best thought of the medical profession as to therapeutic value "

The purpose of pharmacists has been to make the best and largest possible use of the standards and acquaint all who make use of them and thereby bring the professions into closer relationship for service of the public There has been evident a cooperation of all divisions, exhibiting a spirit which will make every revision superior to the preceding

The chairman, members of the committees and other co-workers have been loyal and earnest in their labors, representing achievement and accomplishment The revisions reflect credit and show progress which will make possible corrections and stimulate improvement wherever these efforts may be necessary *List of Errata* may be obtained from the chairmen or found in this issue of the JOURNAL

## THE INFLUENCE OF PHARMACY

PHARMACY has contributed largely to other activities through the services rendered by pharmacists, the only criticism in this connection is that often pharmacy loses all consideration Of this there are outstanding examples Scheele, Caventou, Pelletier, Swan and many others were pharmacists

There are others who in their earlier years were employed in drug stores or

apprenticed in pharmacies, a number who achieved greatness, did so in the practice of medicine or in chemistry or other fields. Nevertheless there is an evident influence that remains with the individual during his life-time. This thought was prompted by the review of a book just published on "T. H. Huxley's Diary of the Voyage of H. M. S. Rattlesnake." In his early teens Huxley was apprenticed to a pharmacist, who paid him six shillings a week. His thoroughness in the pharmacy won the admiration of the doctors who loaned him books and took him to clinics. At the age of 17 he gained a free scholarship to Charing Cross Hospital, after several years of medical studies he was appointed assistant surgeon and at the age of twenty-one Dr. Huxley embarked on the Rattlesnake.

He was a student, and no great claims other than those mentioned can be given to pharmacy. "In his mind life was a sequence—the happenings of to-day were possible because of that which was done yesterday and to-morrow will be the result of to-day." "He dared to utter that which he felt was true, and the strongest desire of his soul was that he might never compromise with error for the sake of mental ease, or accept belief simply because it was pleasant."

Huxley visited the United States in 1876, he spoke at the formal opening of Johns Hopkins on "University Education" from which the following brief quotations are taken. "Again, materia, so far as it is a knowledge of drugs, is the business of the druggist. In all other callings the necessity of the division of labor is fully recognized, and it is absurd to require of the medical man that he should not avail himself of the special knowledge of those whose business it is to deal in the drugs which he uses." Other lines of the address are applicable, evidencing that Huxley remembered his drug store experience.

This experience does not call for mention, but a biographical sketch of Huxley should make reference to the fact, if for no other reason than that this apprenticeship was a sequence in his life.

Recently, Georgia had a "Crawford Williamson Long Day," three memorial celebrations marked the occasion. However much Dr. Long's discovery meant to surgery and to the afflicted, it may be questioned whether such recognition would have been possible if it had not been for the persistent efforts and loyalty of a pharmacist to his preceptor, an apprentice in "the drug shop" of Dr. C. W. Long.

"The Story of Louis Pasteur," recently, was vividly depicted by Paul Muni.

In 1851 the Société de Pharmacie de Paris offered a prize of 1500 francs for the following two problems: (1) Do tartrates exist actually containing the racemic form of tartaric acid? (2) Determine the conditions under which tartaric acid might be transformed into its racemic form. Pasteur was awarded the prize, half of which he devoted toward purchasing certain necessary apparatus which lack of funds had prevented the University from acquiring for the use of his laboratory.

In 1846 Pasteur was assistant in Balard's laboratory (pharmacist). Here he prepared his thesis on "Arsenous Acids and the Arsenites of Potassium, Sodium and Ammonia." In 1849 he went to Strasbourg School of Pharmacy as Assistant Professor.

Applying Huxley: "Life is a sequence—the happenings of to-day are possible because of that which was done yesterday and to-morrow will be the result of yesterday"—Pasteur's work in pharmacy contributed largely to the achievements of a great mind.



## SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman* F E Bibbins, Glenn L Jenkins, John C Krantz, Jr.,  
Heber W Youngken, L W Rowe, L W Rising, C O Lee, E V Lynn, W G Crockett,  
Frederick V Lofgren

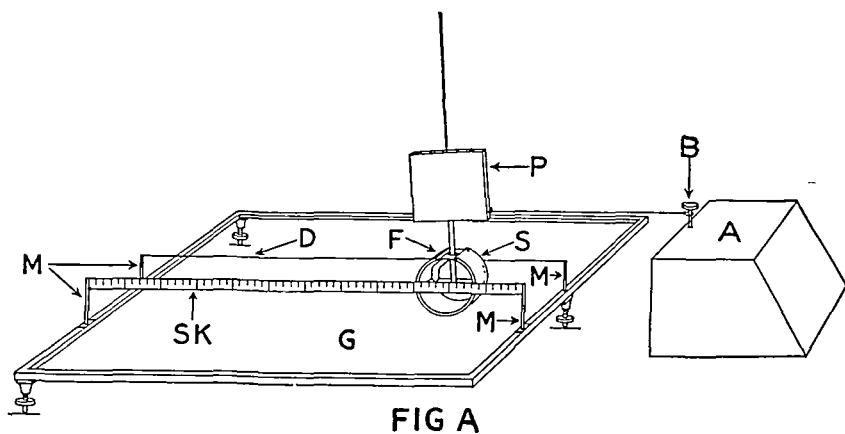
# A METHOD FOR THE MEASUREMENT OF CERTAIN MECHANICAL PROPERTIES OF PHARMACEUTICAL AND TECHNICAL CREAMS\*

BY JOHN URI LLOYD, WOLFGANG OSTWALD AND HANS ERBRING

## INTRODUCTION

It is a generally known fact that the mechanical properties of cosmetic skin creams are widely different. Olive oil, for example, lends itself well to massage, while with lanolin, massage is practically impossible, because in the latter case the film produced on the skin is sticky instead of being smooth. Still more complicated phenomena are observed, as the senior author has pointed out, with certain skin creams in which the base consists, for example, of plant mucilages. If a small quantity of such an aqueous mucilage is put upon the back of the hand and rubbed down with the other hand, one notes at first only the sensation of wetting with water. Upon continued rubbing, however, this sensation suddenly changes to that of stickiness, and the skin, *i. e.*, the film upon it, appears pronouncedly rough. When rubbing is continued, there is again a rather sudden change, the rough skin suddenly becomes smooth again, and one has the same sensation as in rubbing soft kid leather.

This interesting observation of the complicated change which the mechanical properties of a cosmetic film undergo solely in consequence of a continuous rubbing down, formed the starting point in investigations now to be described



First of all the question arose, whether this change of the mechanical properties was merely of a subjective, or perhaps physiological nature, dependent, *e g* , on resorption by the living skin, or whether there are not changes in the film itself

\* Translated from the German by Dr Sigmund Waldbott

that might be demonstrated objectively, independent of the living skin. Be it stated as one outstanding result, that the aforementioned complicated changes in the mechanical condition of such cosmetic films may in fact be demonstrated objectively, and that they are not a function of the living skin as a substrate.

#### DESCRIPTION OF THE APPARATUS

The apparatus used in the subsequent experiments is illustrated in Figs. A and B.

A glass plate (Fig. A, G) is within a metal frame supported by 3 short legs which are provided with set-screws for horizontal leveling by means of a round box level. To the frame are attached at the right and the left, in each case, 2 vertical metal rods (*M*) each about 5 cm. long. One set of opposite rods is united by a metal bridge, on the front of which there is a millimeter scale (*SK*) and the other set by a very thin metal wire (*D*) drawn taut. These two metal connections serve as a guide for a sled (*S*) which can be moved to and fro between them.

The sled itself (Fig. B, *S*) is a short, hollow, horizontal cylinder of brass, tightly fitting into a slightly wider glass cylinder of the same length, which surrounds it except on top, where a strip of the glass is removed. An index (*Z*) at the front top edge of the sled measures its prevailing location by means of the scale.

In the lower half of the brass cylinder there is a horizontal brass plate with a round hole in the center, exactly below another hole in the top of the brass cylinder. Through these openings passes a metal rod, *i. e.*, the end of a pendulum (*P*) about 2 m. long, having a driving weight of 10 Kg. By this arrangement, the metal rod has no rigid connection with any part of the sled, and the amount of friction of the sled against the guide connections is negligible.

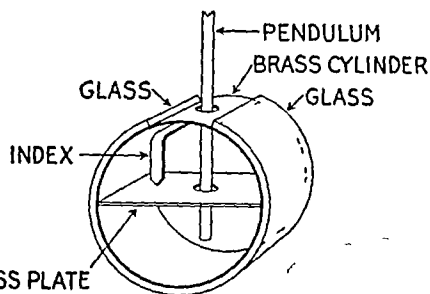


FIG B

When the pendulum swings, the sled is moved along, and from the character of the vibration and the character of the diminution curves (*Dämpfungskurven*), conclusions may be drawn as to the lubricating and sliding ability of the medium put between the sled and the glass plate.

In order to obtain a constant altitude of fall for the pendulum, *i. e.*, a constant driving force with which to move the sled on its base, an arresting device (*A*) for the pendulum is installed. The pendulum is set swinging by removing a steel pin (*B*) in order that the altitude and the number of vibrations upon swinging freely be always the same.

With the aid of this arrangement, pure liquids and plant mucilages, emulsions and creams were examined, by observing their behavior upon friction between glass surfaces.

#### EXPERIMENTAL RESULTS

*I Pure Liquids*—As mentioned at the beginning of this article, different plant mucilages present the phenomenon of having their gliding ability altered

with length of time of trituration. This effect, no doubt of complex nature, rendered it advisable for the purpose of seeking an explanation, first to use *pure* and *homogeneous* liquids and semi-fluid substances.

The experiments were conducted as follows:

A small portion of the substance to be examined was put upon the glass surface, and spread over the total surface involved in the rubbing. Then the rod of the pendulum was put through the holes of the sled, and the pendulum was "fixed" in place by the arresting device. Upon removing the little steel bolt, the pendulum began swinging, moving the sled with it back and forth on the glass plate. The number of vibrations, as well as the "rate of diminution" ("Dämpfung") then becomes a measure of the "gliding allowance" of the thin lubricating or sliding film between sled and glass surface.

When this sliding film has formed, we should expect that for pure systems in which mechanical manipulations cause no changes whatsoever, the "sliding ability" would be independent of the *number* and the *duration* of the sled movements, pro-

vided that the film does not evaporate. This phenomenon has indeed been clearly verified with all systems examined. The results are shown in Fig 1.

The abscissæ represent times in minutes, during which the sliding ability was continuously observed. The ordinates show the (relative) sliding ability, *i e*, number of vibrations within a given time.

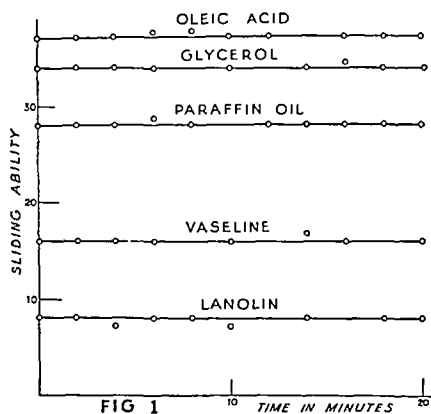
For example, with *oleic acid*, 10 consecutive experiments were carried out, the number of vibrations proved to be the same in each experiment. Similar graphic results are obtained for the other

substances (systems) examined. In each case the result is a straight line (each at a different ordinate) which indicates the fact that sliding ability is a specific *constant* of the substance in question, and independent of the duration of the mechanical trituration. The figures for the "slide value" or "slide degree" of each system are given in Table I. The order in which the systems range themselves by the results of these experiments (oleic acid, glycerol, paraffin oil, vaseline, lanolin) is in accordance with experience.

TABLE I

Substance	Relative Slide Degree
Oleic acid	37
Glycerol	34
Paraffin oil	28
Vaseline	16
Lanolin	8

Parallel measurements with *viscosities* of these substances show that the apparatus we use measures a distinct *sliding effect*, which does not simulate viscosities.



Thus the glycerol used gave a result in viscosity about 20% higher than the paraffin oil examined, yet the sliding effect of glycerol is considerably greater. A large number of other systems examined, demonstrated similar facts.

*II Creams of the Type "Water in Oil"*—An essentially different picture is obtained when no longer pure systems, but *compound systems*, are investigated.

We have examined a large number of commercial pharmaceutical and cosmetic creams for their frictional or sliding capacities. First, we examined so-called "fatty creams," which represent emulsions of the type "water in oil." The graphic picture of all samples investigated, which differ but slightly one from the other in their behavior, is represented for 1 sample in Fig 2.

A similar graph we obtained with emulsions prepared by ourselves with varying water content in vaseline or paraffin oil. We do not here need to give the different curves and figures.

At the beginning of the measurement we note at first that in each single experiment the numbers of sled movements at the same driving power until the pendulum stops swinging, remains the same. Then, however, the curve becomes more or less steep upward, that is, the sliding ability of the cream increases. When the experiments are further continued, there will again be a constant end value.

Different causes may be held responsible for this interesting increase in the sliding, lubricating or massage ability of such "water in oil" creams. First, the thought suggests itself that on account of the continued mechanical manipulation of the "emulsion film" produced, a further dispersion effect is obtained. An emulsion cream of higher dispersion perhaps has a better sliding ability than one more coarsely dispersed. However, just as well an opposite process might take place, caused by mechanical, temperature or electrical influence, *i e*, destruction of the emulsion in the film and a sliding of the sled finally upon the pure "fatty" surface.

A more detailed examination of the effect has not yet been made, our present purpose was to find and work out a method for the examination and technical development of such creams.

*III Creams of the Type "Oil in Water"*—Another group of systems examined by us is Creams which one might designate as "oil in water" emulsions. They are the so-called "day creams," "face creams" or "matt creams." Since in these creams the coherent (dispersing)

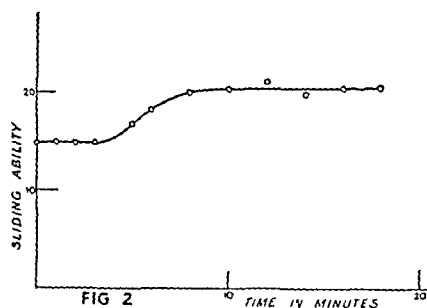


FIG 2

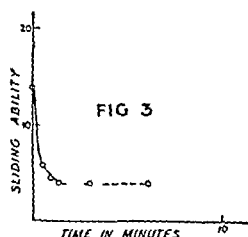


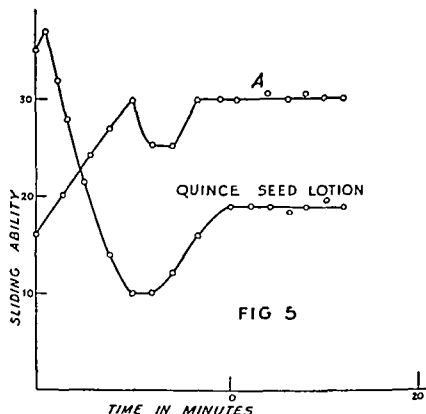
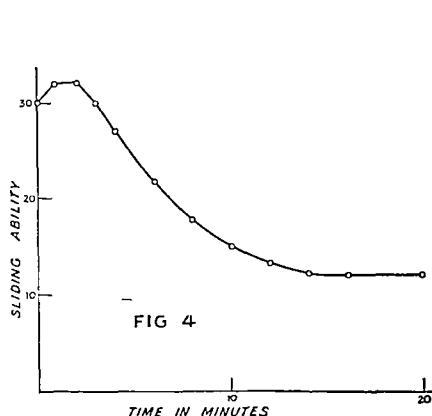
FIG 3

phase is water, in which, for example, finely divided stearic acid particles are distributed in very highly dispersed form, one may expect from the start a different appearance of the sliding curves. When rubbed upon the hand, these creams show very rapidly a certain resistance, *i e*, the sliding ability decreases more and more during rubbing. Indeed, the same effect is obtained with our apparatus. Figure 3 shows the nature of the curves obtained with these samples. With continuous rubbing we note a steep decrease, and the manifestation of a certain end value.

at a certain low sliding ability (or better, degree of "roughness"), of the stearic film produced. We suppose that in this end condition, the aqueous dispersing phase has to a large extent evaporated.

*IV Vegetable (and Gelatin) Lotions with Glycerol*—Undoubtedly the most interesting phenomena are obtained with by far the largest number of plant jellies. With these systems we find the complex behavior mentioned in the beginning. An intermediate stage of stickiness which makes the skin rough, and upon further rubbing the change to smoothness, whereby the skin feels like kid leather. Our apparatus illustrates objectively these different conditions which would well recommend the apparatus for examination of the mechanical properties of creams, rubbing materials, sliding materials, etc.

A commercial gelatine-glycerol jelly, showed a curve represented in Fig 4, *i e.*, of a nature very similar to that obtained by rubbing on the skin. The slight rise of sliding ability at the beginning of the rubbing, indicates only a *gradually*



intimate contact at first of the sled with the sliding material. This initial rise is especially pronounced in the following examples.

Two samples were examined (1), a Quince seed lotion, and (2), a plant product of similar composition in American commerce. In both samples we distinctly observe the intermediate stage of "stickiness" (see Fig 5). But we furthermore recognize that the end value of sliding ability, *i e.*, the condition of "smoothness" in the commercial preparation, is considerably higher, *i e.*, better, than in the Quince seed lotion.

A further plant product, a mucilage-jelly that had been obtained from flax seed was examined. Figure 6, I-III, informs us about the degrees of mechanical usefulness of this product.

After the real slide film has been formed, sliding ability decreases. The polished layer becomes rough and dull, evidently on account of decreasing water content, as in general one may perhaps be justified in associating the degree of stickiness with a definite quantity of water that happens to exist in the system. Experiments to avoid, or rather to improve this rough and dull terminal step in the gliding experiment, so undesirable in mechanical, and more so in cosmetic respect,

led to improvement of this preparation by addition of glycerol. We observe the steady improvement of the final stage, the curve moves to higher and higher degrees of sliding ability

#### GENERAL SURVEY

The experiments herein described show that the apparatus used, gives in an excellent manner information on certain mechanical properties of Creams, Emulsions, lubricating materials, etc. No doubt this may be of some importance in

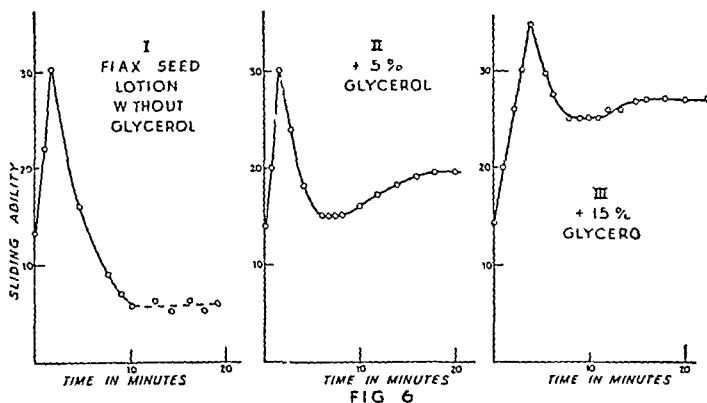


FIG 6

technology, especially as to cosmetics. By means of it, it will be possible to get information within a few minutes concerning important mechanical properties of creams (e g, for massage purposes), objectively and reinforced by figures. Of course, besides the mechanical qualities, the specific, pharmacological and physiological effects upon the skin are of no less importance to the question of quality and adaptability of a cosmetic cream.

#### SUMMARY

A method is described making it possible to characterize, objectively and numerically, the "sliding ability" of skin creams, lubricating and anti-friction materials, etc., and their very manifold and characteristic changes which take place upon continuous trituration.

A few examples of interest cosmetically are represented by curves

#### DRUG EXTRACTION IX THE EFFICIENCY OF REPERCOLATION FOR BELLADONNA ROOT AND NUX VOMICA \*<sup>1</sup>

BY WILLIAM J HUSA<sup>2</sup> AND C L HUYCK

Although the process of repercolation has been known for many years there is practically no information in the literature giving definite data as to the efficiency of the U S P X process of repercolation. The pioneer work of Squibb was con-

\* Scientific Section A P H A, Portland meeting, 1935

<sup>1</sup> This investigation was aided by a grant from the AMERICAN PHARMACEUTICAL ASSOCIATION Research Fund

<sup>2</sup> Head Professor of Pharmacy, University of Florida

cerned with the now obsolete method of saving the weak percolates from one batch of drug and placing them in storage until the next time the fluidextract was to be prepared which might be a matter of months or years. The expense of storage, the idle investment in menstrua and the possibility of deterioration during storage are the chief factors responsible for the unpopularity of this method.

The work of Diehl, which was carried out during the same period as that of Squibb, dealt with a repercolation process for half-strength fluidextracts. There was some agitation at that time for use of 50 per cent fluidextracts based on the claim that such fluidextracts could be made by the retail druggist, while the adoption of 100 per cent fluidextracts would throw the preparation of fluidextracts into the hands of the large manufacturers. However, the 50 per cent fluidextracts were not adopted and hence the work of Diehl has little application to present-day repercolation.

In later studies by Arny and Oxley (1) the repercolation process did not appear to give favorable results. This was judged from the fact the repercolation of gentian did not in most cases give a product that contained as much total extractive as did simple percolation with evaporation of the weak percolates. Scoville (2) stated that on the basis of his experience repercolation could be used with excellent results with drugs which percolated easily such as capsicum and resinous drugs in general.

As an advantage of the repercolation process, it has been stated (3) that a weak solution of the extractive of a drug is usually a better solvent for the active constituents than the original menstruum.

In order to throw some light on the exact efficiency of the U S P X repercolation process, experiments have been conducted with belladonna root and nuxvomica.

#### EXPERIMENTAL PART

*Fluidextract of Belladonna Root*—Using belladonna root in No. 40 powder (assaying 0.43% alkaloids) a 1000 cc. portion of fluidextract was prepared, following the U S P X directions for making fluidextracts by Type Process C (repercolation). The assays showed that 1000 cc. of finished fluidextract contained 4.6 Gm. of alkaloids and 87.7 Gm. of total extractive. These results show that repercolation was successful for belladonna root. In fact the quantity of alkaloids based on the assay of the powdered drug should have been only 4.3 Gm. This difference is probably not entirely an experimental error since in previous work it has been found (4) that extraction with the official menstruum gives slightly higher results in alkaloids than can be obtained in the official assay using ether chloroform mixture.

In order to check up on the quantity of alkaloids in the separate reserve portions these were assayed with results as shown in Table I.

TABLE I—ASSAY RESULTS ON RESERVE PORTIONS OF FLUIDEXTRACT OF BELLADONNA ROOT

	Gm. Alkaloids	Gm. Total Extractive
200 cc. reserve portion	1.2	15.9
300 cc. reserve portion	2.1	30.5
500 cc. reserve portion	1.3	43.8
<hr/> Total	<hr/> 4.6	<hr/> 90.2

Some of the experimental details of this experiment are as follows. The 500 Gm. portion of the drug was moistened with 300 cc. of menstruum, the time of percolation was 18 hours for the

reserve portion and 8, 10  $7\frac{1}{2}$ ,  $7\frac{1}{2}$  and  $7\frac{1}{2}$ , respectively, for the successive weak percolates. The 300 Gm portion of drug was moistened with 180 cc of weak percolate and the reserve portion was collected in  $25\frac{1}{2}$  hours; the time of percolation for the successive weak percolates being 5, 7 and 6 hours, respectively. The 200 Gm portion of drug was moistened with 120 cc of weak percolate and the reserve portion was collected in 35 hours.

*Repercolation of Nux Vomica*—Using nux vomica in No. 40 powder (assaying 2.3% alkaloids) a 1000-cc portion of fluidextract was prepared. The U S P X repercolation process was used with menstrua as follows: Menstruum I—acetic acid 100 cc, water 150 cc, alcohol 750 cc; Menstruum II—alcohol 3 volumes, water 1 volume. Five tenths of the acetic acid were used for the 500 Gm portion of drug, and three tenths and two-tenths for the 300 Gm and 200 Gm portions, respectively. The acid for the two latter portions was added to the first portion of weak percolate used as menstruum in each case. To keep the alcohol content the same, a volume of water equal to that of the acetic acid used for the last two portions was left out of Menstruum II. The rates of flow were as follows: 500 Gm portion, 2 to 3 cc per minute; 300 Gm portion, 2 cc per minute; 200 Gm portion, 1 to 2 cc per minute.

The assays showed that 1000 cc of finished fluidextract contained 21.9 Gm of alkaloids and 128.8 Gm of total extractive. Assays on the reserve portions are shown in Table II.

TABLE II—ASSAY RESULTS ON RESERVE PORTIONS OF FLUIDEXTRACT OF NUX VOMICA

	Gm Alkaloids	Gm Total Extractive
200 cc reserve portion	4.9	28.3
300 cc reserve portion	9.2	49.7
500 cc reserve portion	7.9	50.2
<hr/> Total	<hr/> 22.0	<hr/> 128.2

Repercolation was fairly successful for nux vomica as 1000 cc of fluidextract contained 22.0 Gm of the 23.0 Gm of alkaloids shown to be present by assay of the drug.

#### SUMMARY

Because of the lack of definite data in the literature as to the exact efficiency of the U S P X repercolation process, experiments were carried out with two alkaloidal drugs. Repercolation was successful for fluidextract of belladonna root and fairly successful for fluidextract of nux vomica.

#### REFERENCES

- (1) Arny and Oxley, *Proc. A. Ph. A.*, 58, 1104 (1910).
- (2) Scoville, discussion of paper by Arny and Oxley, reference (1).
- (3) Bennett and Cocking, "The Science and Practice of Pharmacy," Vol. I (1933), page 134.
- (4) Husa and Magid, *Jour. A. Ph. A.*, 23, 891 (1934).

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The service of pharmacy should be impressed on the public, omissions or misapplied credits are perhaps not intentional but result because the historians or biographers are not informed or do not appreciate the importance of the services rendered. Referring to Huxley—"He dared to utter that which he felt was true, and the strongest desire of his soul was that he might never compromise with error for the sake of mental ease, or accept belief simply because it was pleasant."



# PREPARATION AND TOXICITY OF BISMUTH SALTS OF CAMPHORIC ACID ESTERS \*

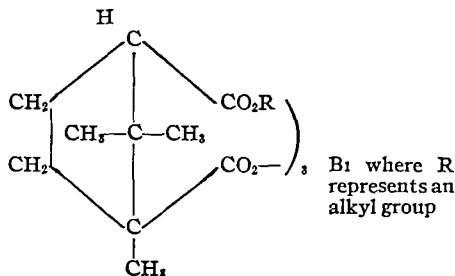
BY W M LAUTER AND H A BRAUN <sup>1</sup>

The use of lipoid soluble bismuth preparations in the therapy of syphilis has increased interest in those salts of bismuth which are soluble in vegetable oils and are of low toxicity. It was in this connection that we began the investigation of three acid esters of camphoric acid and their bismuth salts.

The preparation of ortho-esters of *d*-camphoric acid has been described by Walker (1, 2), Ross and Sommerville (3), and by Edmanson and Hilditch (4). We have followed Walker's (*loc cit*) method in preparing the ortho-methyl, ethyl and butyl esters of the acid.

Liebrecht (5) in a patent has given a general procedure for preparing bismuth salts of ortho- as well as allo-camphoric acid esters without furnishing proof of their constitution and purity. He does, however, make reference to their strongly trypanocidal action.

Walker (1, 2) and Edmanson and Hilditch (4) prove that the reaction between camphoric anhydride and sodium alcoholates gives a quantitative yield of ortho-alkyl-hydrogen-camphorates, and that no allo-esters are formed. The reaction product, therefore, is in each case a neutral bismuth salt of the following constitution



**Preparation of Bismuth Tri Methyl Camphorate**—45.5 Gm *d* camphoric acid anhydride are slowly added to a solution of 5.75 Gm sodium in 290 cc methanol. After standing for 2 hours the solution is evaporated to a volume of 90 cc. The white crystals are filtered cold and washed with a few cc of methanol. The yield is 33.4 Gm sodium-methyl camphorate or 59% of the calculated yield. The material left in the methanol solution was discarded.

33.4 Gm sodium-ortho methyl camphorate were dissolved in a solution composed of 100 cc H<sub>2</sub>O and 75 cc glycerine. 23 Gm Bi(NO<sub>3</sub>)<sub>3</sub> · 5H<sub>2</sub>O were dissolved in an equal amount of the same aqueous glycerine solution. The bismuth nitrate solution was added slowly, while stirring, to the solution of the sodium salt. A white precipitate was formed. It was found that the elimination of the last traces of glycerine could only be accomplished by dissolving the product in ether, washing the ether solution with water and subsequent drying with Na<sub>2</sub>SO<sub>4</sub>.

A yield of 30.0 Gm was obtained. The presence of some more bismuth methyl camphorate could be shown in the water glycerine solution, but its recovery was not attempted. The yield is 83.6%. The melting point is 60.5–62.5° C.

The analysis is as follows: 0.3000 Gm vacuum dried salt gave 0.904 Gm Bi<sub>2</sub>S<sub>3</sub> = 24.50% Bi. Calculated, 24.64% Bi.

\* Scientific Section A. P. H. A.

<sup>1</sup> From the Research Laboratories of The Upjohn Company, Kalamazoo, Michigan.

The solubility in vegetable oils mentioned previously by Liebrecht (5) was investigated. Oil of sweet almonds was used because of its superiority to most vegetable oils in resisting oxidizing agents.

0.7624 Gm bismuth ortho methyl camphorate was warmed with 4 cc of oil of sweet almonds U S P X cooled and filtered. 2 cc were analyzed for bismuth.  $0.0428 \text{ Gm Bi}_2\text{S}_3 = 17.4 \text{ mg Bi in 1 cc} = 7.061 \text{ Gm bismuth-methyl-camphorate dissolved in 100 cc room temperature saturated solution}$

It was of pharmaceutical interest to determine the influence of certain compounds of therapeutic importance upon the oil solubility of this bismuth salt. It was found that oil of sweet almonds containing 0.5% anhydrous chlorbutanol by weight contained 17.60 mg Bi per cc, or 7.142 Gm salt in 100-cc solution. The increase is therefore slight.

A decided and fully anticipated increase in solubility, however, was noted when 10% camphor by weight was added to oil of sweet almonds.

2 cc of a room temperature saturated solution analyzed as follows:  $0.0610 \text{ Gm Bi}_2\text{S}_3 = 24.8 \text{ mg Bi per cc} = 10.07 \text{ Gm bismuth methyl-camphorate in 100 cc solution}$

*Preparation of Bismuth-Tri-(Ortho-Ethyl-Camphorate)*—The ethyl ester was prepared in an analogous manner by reacting sodium-ortho-ethyl camphorate in a 50% (by weight) glycerine solution with a 50% (by weight) aqueous glycerine solution of  $\text{Bi}(\text{NO}_3)_3$ .

The heavy metal salt obtained is washed with water, finally dissolved in chloroform, the chloroform solution washed several times with water and finally dried with  $\text{MgSO}_4$ . The solvent is driven off by heating *in vacuo* for  $1\frac{1}{2}$  hours at  $115^\circ \text{C}$  in an oil-bath. The yield is 63.6%. The salt melts between  $54^\circ$  and  $57^\circ \text{C}$ . The analysis shows it to be a neutral salt.

Found 23.51% Bi

Calculated for  $\text{Bi}(\text{C}_8\text{H}_7\text{CO}_2\text{C}_2\text{H}_5)_3 \cdot \text{CO}_2$ , 23.47% Bi

The salt is easily soluble in ether, acetone, chloroform, ethylene-dichloride and vegetable oils.

Solvent.	Milligrams $\text{Bi/Cc}$ Metallic in a Room Temperature Saturated Solution	Gm Bis- muth Ethyl Camphorate in 100 Cc Solu- tion at Room Temperature
(1) Oil of sweet almonds, U S P X	39.5	16.03
(2) Oil of sweet almonds + 0.5% anhydrous chlorbutanol	41.82	16.97
(3) Oil of sweet almonds + 10% camphor	94.1	38.18

The influence of heat was studied by heating the salt for 16 hours at  $160^\circ \text{C}$ . It assumed a darker color. The product obtained was isolated by dissolving it in ethyl acetate and pouring the solution into methanol. A white salt was obtained insoluble in oil of sweet almonds and melting over a range of  $204\text{--}220^\circ \text{C}$ , while the bismuth-ethyl-camphorate had a melting point of  $54\text{--}57^\circ \text{C}$ . The analysis was as follows:  $0.3000 \text{ Gm gave } 0.0954 \text{ Gm Bi}_2\text{S}_3 = 25.86\% \text{ Bi}$

It is probable that the ethyl groups have been split off because the camphoric acid molecule itself is quite stable, and without the presence of moisture there is no reason to assume the formation of a basic bismuth salt. The analysis also contradicts that. Furthermore a neutral bismuth-camphorate, prepared by reacting sodium-camphorate with  $\text{Bi}(\text{NO}_3)_3$  gave a bismuth-camphorate insoluble in vegetable oils. When bismuth-ortho-ethyl-camphorate was heated at  $250^\circ \text{C}$  in a 40-mm vacuum, white crystals could be detected in the reception flask which, after

recrystallization from hot alcohol, were found to have a melting point of 220–221° C and were identified as camphoric anhydride

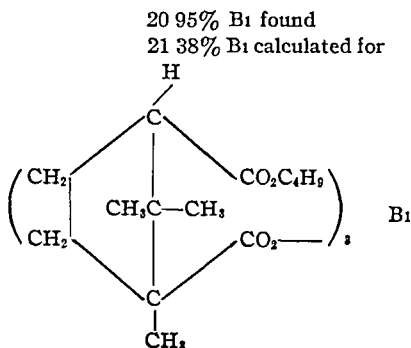
The solubility of this bismuth salt in oil of sweet almonds, U S P X, was investigated and the data shown on preceding page were obtained

The addition of 10% camphor, as in the case of the methyl salt, increases the solubility to a considerable degree. The greater solubility of the ethyl compound compared with the methyl compound is apparent

*Preparation of Bismuth Tri-(Ortho *n*-Butyl-Camphorate)*—The sodium-ortho *n* butyl hydrogen camphorate is prepared according to Edmison and Hilditch (4) by reacting 1 mol camphoric anhydride with 1 mol sodium *n* butylate in a solution of *n* butanol. After removing the excess butanol by evaporation *in vacuo* on a steam-bath the salt is obtained as a viscous oil easily soluble in water

40.5 Gm  $\text{Bi}(\text{NO}_3)_3 \cdot 5\text{H}_2\text{O}$  are dissolved in a solution of 75 cc glycerine in 100 cc  $\text{H}_2\text{O}$ , and this salt solution is then added slowly, while stirring and cooling to a solution of 69.5 Gm sodium ortho *n* butyl camphorate in 150 cc  $\text{H}_2\text{O}$  + 90 cc glycerine. The viscous heavy precipitate is washed several times with water then dissolved in ether, and the ether solution is washed until no more glycerine could be detected in the washings. The ether is evaporated and the residual very viscous oil is then dried *in vacuo* at 115° C for 1½ hour. The further purification is achieved by redissolving the salt in cold methanol and precipitating it again by pouring it into water. The clear yellow oil is then washed with water, taken up again in ether and the ether solution dried with  $\text{Na}_2\text{SO}_4$ . The bismuth salt is now dried *in vacuo* at 100–150° C for 1½ hours. The yield is 65.7 Gm = 73.5% of the calculated amount

The analysis is as follows



*Comparative Toxicity of the Camphorates*—In these experiments, it was our object to determine the minimum lethal dose (M L D) which is the dose which will kill more than 50% of the animals. The M L D of the three compounds was determined on white rats weighing between 150–250 Gm. The experimental procedure consisted of injecting the three compounds individually into the leg muscles of the rat. Since the toxicity of bismuth compounds is to a large extent determined by their metallic Bi content and their rate of absorption, both of these factors were taken into consideration in our studies. The doses injected were calculated on the basis of the metallic Bi content for each preparation which for the methyl was 17.6 mg of metallic Bi/cc, for the ethyl was 40 mg of metallic Bi/cc and for the butyl 43.3 mg of metallic Bi/cc. The animals were kept under observation for thirty days.

No manifestations of irritation at the point of injection were noted on gross observation after 24 hours, 3 days, 7 days, 14 days, 21 days or 30 days. We ob-

served no indications of pain or stiffening around the point of injection. All three preparations contained small amounts of chloretone which might account for freedom from pain for a short time after injection.

Toxic symptoms with larger doses did not appear until about the sixth or eighth day after injection and death usually occurred from the fourteenth to the twenty-first day. Typical symptoms of bismuth poisoning consisting of emaciation and loss of appetite were noted.

The results of these experiments included in Table I indicate that the M. L. D. for the bismuth-methyl-camphorate is 350 mg metallic bismuth per Kg. of rat. The bismuth-ethyl-camphorate has an M. L. D. of 250 mg B<sub>i</sub>/Kg. while the bismuth-butyl-camphorate is the most toxic with an M. L. D. of 150 mg B<sub>i</sub>/Kg. of rat.

TABLE I—TOXICITY OF BISMUTH-CAMPHORATES IN RATS

Bismuth Methyl Camphorate				Bismuth Ethyl Camphorate				Bismuth Butyl Camphorate			
Dose Mg Metallic Bi/Kg	No of Animals	Days Survival	% Mortality	Dose Mg Metallic Bi/Kg	No of Animals	Days Survival	% Mortality	Dose Mg Metallic Bi/Kg	No of Animals	Days Survival	% Mortality
100	5		0 0 %	75	5		0 0 %	100	5		0 0 %
150	10	24	20%	100	10	17	10%	150	10	18	60%
200	10	16	30%	125	5	30	20%	200	10	18	70%
250	10	18	20%	150	5		0 0%	300	5	17	80%
300	20	12	30%	200	10	15	30%				
350	10	12	80%	250	10	16	70%				
400	5	6	100%	300	10	15	80%				
				400	10	12	100%				

#### SUMMARY

The preparation of the ortho-methyl, ethyl and *n*-butyl esters of the bismuth salt of camphoric acid has been described and their solubility in oil was investigated.

The toxicity in oil solutions was determined by intramuscular injections into albino rats.

#### REFERENCES

- (1) Walker, *J. Chem. Soc.*, 61, 1088 (1892)
- (2) Walker, *Ibid.*, 63, 496 (1894)
- (3) Ross and Sommerville, *Ibid.*, 2770 (1926)
- (4) Edmanson and Hilditch, *Transactions, J. Chem. Soc.*, 225 (1910)
- (5) Liebrecht, German Patent No. 461,830 (1928)

#### PREPARATION OF BENZOYL PERSULPHIDE \*

BY E. MONESS, W. A. LOTT AND W. G. CHRISTIANSEN <sup>1</sup>

Some preliminary clinical results obtained by Drs. Amberg and Brunsting of the Mayo Clinic had indicated that benzoyl persulphide might prove very useful in the treatment of certain selected types of dermatosis in which pruritis was the

\* Scientific Section, A. P. H. A., Portland meeting, 1936

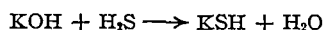
<sup>1</sup> Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.

predominating symptom In order to provide sufficient quantities of this material for more extensive clinical trial the development of a satisfactory method for its preparation on a fairly large scale and in a state of high purity was undertaken

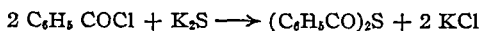
Benzoyl persulphide has been prepared in the laboratory by many investigators in the past, and many oxidizing agents have been used for its production from salts of thiobenzoic acid Engelhardt, Latschinoff and Malischeff (1) obtained it by treating potassium thiobenzoate in aqueous solution with a solution of iodine in potassium iodide Weigert (2) identified a substance as thiobenzoic acid by oxidizing its sodium salt with iodine Fromme and Schmoldt (3) precipitated benzoyl persulphide from a solution of a salt of thiobenzoic acid by means of potassium ferricyanide Kym (4) oxidized free *p* nitro thiobenzoic acid to the corresponding persulphide in alcoholic solution with ferric chloride He emphasizes that only a little ferric chloride must be used, if too much is used, one obtains a gelatinous precipitate which is difficult to crystallize For purposes of recrystallization these authors used mostly, acetone, alcohol or chloroform

It is important that any plant process of producing benzoyl persulphide give uniform and high yields of a product which is reasonably free of impurities, and that the necessity of isolating thiobenzoic acid or its salts previous to oxidation be avoided Furthermore, while iodine is a very suitable oxidizing agent from the chemical standpoint, it is expensive, even when a high proportion of it is subsequently recovered It was therefore necessary to find an oxidizing agent which would be much less expensive, and which, preferably, would not involve the problem of recovery Such an agent was found in hydrogen peroxide

In order to explain the hydrogen peroxide process clearly it is desirable to first discuss the iodine process An alcoholic solution of potassium hydrosulphide is prepared by saturating a solution of potassium hydroxide in absolute ethyl or methyl alcohol with hydrogen sulphide until a diluted test sample no longer gives a pink color with phenolphthalein The reaction is

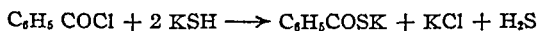


In small scale laboratory experiments the saturation is accomplished quickly, but on a large scale, unless one tests for actual saturation there is the possibility of not quite saturating the solution If the saturation is incomplete potassium sulphide will be present and will react in the next step in the process with benzoyl chloride to form benzoyl sulphide



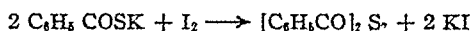
This sulphide does not yield benzoyl persulphide when treated with iodine Therefore, the yield will be lowered in proportion to the amount of benzoyl sulphide formed from the potassium sulphide It also serves as a source of sulphur which will contaminate the product and thereby make purification more difficult

The alcoholic solution of potassium hydrosulphide is then treated with benzoyl chloride using one mol of the latter per two mols of the former The chloride is added slowly with stirring and external cooling The reaction is



The hydrogen sulphide is evolved and the potassium chloride precipitates It is filtered off and washed with alcohol

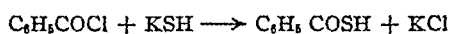
This solution is now oxidized by the addition of solid iodine in small portions, using mechanical stirring and external cooling, until a slight excess of iodine is present as indicated by a slight brownish color of the reaction mixture. During the addition of the iodine, benzoyl persulphide separates out as a fine crystalline precipitate



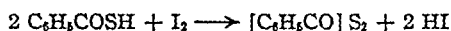
The product is collected on a filter and washed with absolute alcohol. The filter cake contains beside the benzoyl persulphide also most of the iodine in the form of potassium iodide. The latter is separated from the persulphide by washing the cake with water. The extract thus obtained is a clean, water-white solution of potassium iodide, with only a minimum of organic contaminant, from this solution iodine can be recovered either as potassium iodide or as free iodine.

In order to recrystallize the benzoyl persulphide it would be quite impracticable to use acetone or alcohol or chloroform because the benzoyl persulphide is only slightly soluble in these solvents even in the hot (6-7% in hot alcohol or acetone). Tremendous volumes of solvent would be required for recrystallization. We have found that ethylene dichloride is an excellent medium from which to recrystallize benzoyl persulphide. One part of benzoyl persulphide dissolves easily in 2.5 parts of hot ethylene dichloride, and on rapid chilling of the solution a pure white crystalline substance separates out, having a melting point of 128-128.5° C.

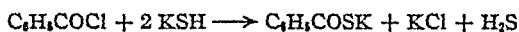
It would appear off-hand that one mol of potassium hydrosulphide per mol of benzoyl chloride should be sufficient, this would be more economical. The reaction would yield thiobenzoic acid instead of the potassium salt



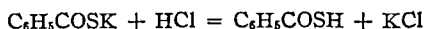
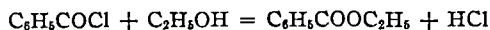
The acid should then give the desired persulphide upon oxidation



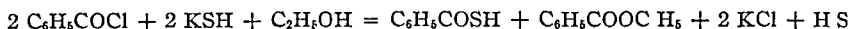
When this was tried experimentally the correct amount of potassium chloride separated but the yield of benzoyl persulphide was only about 50% of the theory. In addition there was obtained from the filtrate an oil, which contained no sulphur and which, after purification, boiled at 208° C., it was found to be ethyl benzoate. The amount obtained showed that it constituted a main product of the reaction and not merely an impurity. It was also noted that though the yield of benzoyl persulphide was small, the crude product was of exceptional whiteness and purity. The conception of the reactions involved, therefore, had to be revised, and the following is the explanation of what takes place when only one mol of potassium hydrosulphide is used. Since benzoyl chloride is being added to the solution of potassium hydrosulphide, the latter is present in excess and reacts as follows



Therefore by the time half of the benzoyl chloride has been added all the potassium hydrosulphide has been used up and the second half of the benzoyl chloride reacts with the alcohol to form ethyl benzoate and hydrochloric acid. The latter reacts with the potassium thiobenzoate to produce potassium chloride and thiobenzoic acid

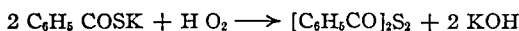


Combining the equations we have



This equation accounts completely for the quantities of products obtained—thus the quantity of potassium chloride obtained is accounted for as well as the fact that by oxidation only 50% of the quantity of benzoyl persulphide is obtained, the rest of the benzoyl chloride forms ethyl benzoate and is not available on the further oxidation with iodine. The exceptional whiteness and purity of the crude product obtained when only one mol of potassium hydrosulphide is used is attributed to the fact that thiobenzoic acid is being oxidized whereas when two mols are used the potassium salt is being oxidized.

*Hydrogen Peroxide Process*—In first trying to use hydrogen peroxide we prepared the solution of potassium thiobenzoate in the same manner as in the iodine process and expected the oxidation to proceed as indicated in the following reaction

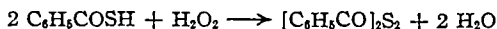


Benzoyl persulphide was indeed formed, but the yield was considerably less than when iodine was used as the oxidizing agent. With the latter the yield was 95–97% of the theory, whereas hydrogen peroxide under the same conditions never gave more than 60% of the theory. Furthermore the product was always contaminated with sulphur. This unsatisfactory result is due to the fact that potassium hydroxide is one of the reaction products, and alcoholic potassium hydroxide is known (3) to decompose benzoyl persulphide according to the equation

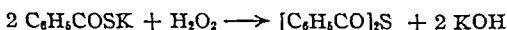


This indicated that merely changing oxidizing agents from iodine to hydrogen peroxide does not produce a satisfactory product, and that a change in the intermediate reactions is necessary.

It will be recollected that when one mol of benzoyl chloride was allowed to react with only one mol of potassium hydrosulphide the oxidation with iodine gave only a 50% yield of benzoyl persulphide. During the work with one mol of potassium hydrosulphide, hydrogen peroxide had been tried in place of iodine and also gave a 50% yield. In other words, the yield is the same with hydrogen peroxide as with iodine, and thus 50% yield was shown to be inherent in the nature of the reactions preceding the oxidation step. Moreover the quality of the crude product obtained using hydrogen peroxide was very high and compared favorably with that obtained using iodine. The only difference between the case in which hydrogen peroxide is used on reaction mixtures prepared with one and two mols of potassium hydrosulphide is that in the former free thiobenzoic acid is being oxidized while in the latter the potassium salt of thiobenzoic acid was being oxidized. In other words when using hydrogen peroxide, we have in one case



while in the other we have



In the second equation alcoholic potassium hydroxide is produced which partially decomposes the benzoyl persulphide while in the first equation only water and benzoyl persulphide result. It is therefore clear that in using hydrogen peroxide as the oxidizing agent we must deal with free thiobenzoic acid and not with its salts. Accordingly the following procedure was adopted. The solution of potassium hydrosulphide was prepared as before by reacting one mol of benzoyl chloride with two mols of the potassium hydrosulphide. At this point, however, instead of proceeding with the oxidation the solution was acidified with an equivalent quantity of alcoholic hydro

chloric acid, and the potassium chloride was filtered off and washed as usual with alcohol. This filtrate, which now contains free thiobenzoic acid in alcoholic solution was oxidized with hydrogen peroxide, and the yield was at once increased from the previous maximum of 60% to 70%. Moreover, the crude product was of a high degree of purity. The yield rose only to 70% because with alcoholic hydrochloric acid present ethyl thiobenzoate is formed due to esterification (1). This can be avoided easily by using dilute aqueous hydrochloric acid instead of alcoholic hydrochloric acid, so that the reaction mixture was only 80% alcohol, instead of absolute alcohol. When this was done the yield at once rose to 91% of the theory, which was quite satisfactory.

#### EXPERIMENTAL

*Preparation of Benzoyl Persulphide Using Iodine as the Oxidizing Agent*—1500 Gm. of potassium hydroxide sticks (about 85% hydroxide) are dissolved in 15 liters of absolute ethyl or methyl alcohol, and saturated with hydrogen sulphide until a diluted test sample is no longer alkaline to phenolphthalein. 1650 Gm. of benzoyl chloride are added in a thin stream from a separatory funnel with good agitation, keeping the temperature of the mixture between 10–15° C. by cooling with a freezing mixture. The separated potassium chloride is filtered off and washed with about 750 cc. of alcohol.

The filtrate and washings are cooled to 10–15° C., and 1620–1740 Gm. of solid iodine are added in small portions to the stirred solution. The temperature is preferably kept at or below 15° C. The rate of the addition of iodine is such that there is only a momentary brown color as the iodine reacts with the potassium thiobenzoate. The addition of the iodine is stopped when a permanent (a few minutes' duration) brown color appears in the reaction mixture. All through the addition of the iodine crystalline benzoyl persulphide separates out. The reaction mixture appears yellow, but after filtering off the crystalline precipitate, and washing with about two liters of alcohol, the cake appears fairly white, and there is no yellow color.

The filter cake is then washed with ten liters of water, receiving the washings in a clean vessel, and the solution is later used for iodine recovery.

The filter cake is dried in air at ordinary temperature. Yield—95% of theory calculated on the basis of benzoyl chloride.

The dried crude product is dissolved with heating on the steam-bath, using 2.5 parts of ethylene dichloride per part of product. The hot solution is filtered through a hot funnel, and chilled rapidly by means of external cooling. A fine white crystalline substance is obtained, melting point 128–128.5° C. The first crop constitutes 90% of the total crude yield.

*Recovery of Iodine*—The aqueous washings are slightly turbid, due to a small quantity of very finely divided benzoyl persulphide. This is filtered off, and a water white, clear solution of potassium iodide is now at hand. The potassium iodide can be crystallized out of this solution and utilized as such or the iodine recovered by saturating the acidified solution with chlorine. The recovery of iodine is 60% of the original amount used.

*Use of Hydrogen Peroxide in the Production of Benzoyl Persulphide*—The solution of potassium hydrosulphide and of potassium thiobenzoate is prepared as usual.

Without filtering off the potassium chloride and with continuous stirring, 1200 cc. of concentrated hydrochloric acid are added in a fairly rapid drip, whereupon some additional potassium chloride precipitates. This is now filtered off and washed with two liters of alcohol, adding the washings to the filtrate. This is diluted with three liters of water at room temperature. Finally 1200 cc. of a 30% solution of hydrogen peroxide is added in a fairly rapid drip with stirring and cooling externally with cold water. When the alcoholic solution of thiobenzoic acid is oxidized with hydrogen peroxide the benzoyl persulphide does not separate at once with each increment of hydrogen peroxide, as in the case when iodine is used. It may begin to separate slowly during this addition, or it may not separate at all until all the hydrogen peroxide is added, after which most of it separates during a period of one-half to one hour. This separation is accompanied by a rise in temperature, which is kept at 30° C. or below by external cooling with water. It is easy to observe the point where the reaction is complete since the yellow reaction mixture turns milky white fairly suddenly, representing a suspension of a white crystalline substance in a water-white, clear mother liquor of alcohol. It is best to permit the mixture to stand over night in the cold, before filtering, since if the suspension were to be filtered at once only about 83% of the yield would be obtained at this stage, the rest crystallizing from the mother liquor on standing.



over night By allowing the whole reaction mixture to stand over night we obtain the total yield with one filtration The crude product is pure enough not to need recrystallization, but may be recrystallized once from hot ethylene dichloride if desired

## REFERENCES

- (1) *Zt f Chem*, 4 358 (1868)
- (2) *Ber* 36, 1010 (1903)
- (3) *Ber*, 40 2862 (1907)
- (4) *Ber*, 32 3533 footnote (1899)

EVALUATION OF LIME METHODS FOR DETERMINING MORPHINE  
IN OPIUM \*

BY V H WALLINGFORD AND AUGUST H HOMEYER \*\*

The literature on the determination of morphine in opium prior to 1920 was reviewed by Jermstad (1) who compared experimentally 16 official and 14 non official methods The early work was frequently unscientific and self-contradictory Recent investigators have viewed the problem more critically and attempted to uncover the errors in the most widely used procedures Hollman (2) investigated certain features of lime and ammonia methods Reimers (3) made a critical review of the literature from 1920 to 1930

Our research leads us to conclude that no method developed so far is satisfactory and that the precision obtainable varies with the type of opium tested The behavior of pure morphine when subjected to many of the operations typical of lime methods has been studied in detail and the effects of various added substances have been quantitatively determined Procedures have been devised for evaluating the errors of the principal methods now in use and the method proposed by the Commission of the League of Nations

"Ammonia Methods" such as Jermstad's (1) are considered unsound in principle because, as pointed out by Reimers (3), the separation of narcotine from morphine by fractional precipitation with ammonia is not sharp The lime method of the United States Pharmacopœia, Tenth Edition (U S P X), the method of Dr Joseph Rosin (4)<sup>1</sup> and "ammonia methods" use water to extract morphine from opium In our experience and that of other workers (2), (5), (6), (7) this extraction is sometimes incomplete due to insufficient natural acidity of the opium

In the methods of the United States Pharmacopœia X, British Pharmacopœia of 1932 (B P) and Rosin empirical aliquot parts are used which do not take into account variable factors of the opium which affect the solution Our work has shown this practice to be inaccurate, in a particular case a U S P X assay was

\* The subject matter of this paper was submitted privately to H J Anslinger, United States Commissioner of Narcotics and members of the Commission of Experts of the League of Nations engaged in standardizing opium assay methods in two progress reports dated April 2 and June 25, 1935 Acknowledgment was made in the Quarterly Bulletin of the Health Organization of the League of Nations Vol IV Extract No 16 page 816

\*\* Contribution from the Organic Research Laboratory of the Mallinckrodt Chemical Works St Louis Mo submitted for publication July 24 1935

<sup>1</sup> Since this paper was prepared Dr Rosin's method has been adopted in the U S P XI and becomes official on June 1 1936

2 per cent too high on account of this error. Recent workers (1), (2), (8), (9), (10) have recognized this source of error, and the lime method reported by van Itallie (11) for the Commission of the League of Nations (hereafter referred to as the L N method) provides for determination of moisture and extractibles and precise calculation of the aliquot.

Since the method reported by van Itallie is being proposed by the League of Nations as an international method, it should be pointed out that this procedure is subject to several errors inherent in all lime methods. We shall discuss these errors briefly at this point before presenting the experimental evidence on which our conclusions are based.

Morphine to the extent of 2 or 3 per cent of the total is carried down into the marc with the precipitate of calcium meconate. Our results are corroborated by Mallory and Valaer<sup>1</sup> who isolated similar amounts of "insoluble" morphine from thoroughly washed lime marcs by a different experimental procedure. Hollman (12) was also of the opinion that adsorption of morphine by the insoluble residue can cause a loss, and Marden and Elliott (13) observed coprecipitation of morphine with barium carbonate. Baumgarten (14) believed that practically none of the alkaloid remained in an insoluble form in the lime residue.

The assay morphine has been found to be contaminated by several per cent of titratable impurities such as by-alkaloids, calcium carbonate, etc. Baggesgaard-Rasmussen, Jackerott and Jespersen (15) found the optical rotation of L N assay morphine to be lower than that of the pure substance and methoxyl groups were detected by Zeisel's method. Rakshit (16) isolated 5.65 per cent benzene soluble impurities, including 3.6 per cent codeine, from B P assay morphine. By-alkaloids have been found in assay morphine<sup>2</sup> by Smith (17), Hollman (2), (12) and Jermstad (1). Marden and Elliott (13) have shown that water saturated with ether is as good a solvent for codeine as ether saturated with water. Therefore, an ether layer does not remove codeine from the water layer or prevent its coprecipitation with morphine. We have shown that lactose (and probably other substances) raises the assay<sup>3</sup> due, perhaps, to the formation of a titratable calcium complex. This explains in part the high results and impure assay morphine obtained by Jermstad (1) with lime methods. This error was not eliminated by extracting the assay morphine with methanol.

The solubility of morphine in the mother liquor depends in part on the kind and amount of gums, etc., present in the solution. This point was investigated carefully by Hollman (2). The correction adopted by the League of Nations Commission amounts to 28.5 mg. per 25 Gm. of lime filtrate taken in the assay, or 1.14 mg. per Gm., and is admittedly arbitrary. Our own work indicates that the solubility is 0.55 mg. per Gm. of lime solution when the starting material is pure.

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<sup>1</sup> Private communication from Messrs. G. E. Mallory and Peter Valaer, Jr., of the Bureau of Internal Revenue, Washington, D. C. Cf. Mallory and Valaer, *Am. J. Pharm.*, 107, 515 (1935).

<sup>2</sup> Recently Rosin and Williams (22) reported finding about 3 per cent by-alkaloids in U. S. P. assay morphine and that extraction with methanol eliminated approximately 2 per cent of titratable impurities.

<sup>3</sup> Damas (18) found that large amounts of saccharose reduced the assay.

morphine In the case of one type of opium the solubility was found to be 16 mg per L N assay or 0.66 mg per Gm of lime extract

A method of purifying assay morphine published by Thoms (19) has been used by Jernstad (1) and Hollman (2), and Smith (17) described a method of determining certain impurities For the purpose of this investigation a method was developed for purifying assay morphine by repeated precipitations under arbitrary but carefully standardized conditions The morphine could be accounted for quantitatively by the application of a suitable solubility correction The precision and reproducibility of the method is shown by our experimental work on pure alkaloid and assay morphine<sup>1</sup> The method proved valuable in the study of lime assays and particularly in determining the purity of assay morphine when no other procedure seemed applicable Although the process is tedious it has proved valuable in research work Recently Mannich (20) has developed a method of determining morphine as the 2,4-dinitrophenyl ether which may prove useful

#### EXPERIMENTS ON PURE MORPHINE

It seemed logical to investigate first the behavior of pure morphine when subjected to many of the operations typical of lime methods The effects of various substances such as lactose, meconic acid and pseudomorphine in the lime method of assay were likewise studied using pure morphine in place of opium The significance of these results is pointed out later in connection with the experimental data

Since the reprecipitation procedure is repeatedly referred to in the later discussion it will be described in some detail

*Reprecipitation of Pure Morphine*—In Table I are given the results of reprecipitation of highly purified morphine The samples of crystal alkaloid were weighed accurately and dissolved in a slight excess of 0.1N sulphuric acid and the excess titrated with 0.1N sodium hydroxide using methyl red indicator The average titration of nine samples indicated 93.44% anhydrous base with an average deviation of 0.2% The percentages given in the third column are based on the average titration

The solutions were adjusted to the net weights indicated in the fourth column U. S. P. alcohol and peroxide free ether were added in the ratio of 2 cc. and 15 cc., respectively, per 30 Gm. aqueous solution Then 1N ammonia was added, series A, 4 cc., series B, 8 cc., and series C, 11 cc. After keeping at room temperature with occasional shaking for 4 hours the samples were kept in a refrigerator at 5° C. over night The morphine was filtered off, washed, dried, dissolved in neutral absolute methanol and titrated as in the L. N. method The difference in mg. between the anhydrous morphine taken (based on weight and average titration) and the amount titrated after precipitation is tabulated as the loss by the first reprecipitation

The titrated solutions were concentrated by evaporation on the steam bath, the residual liquor was transferred quantitatively by several small portions of hot water to a flask, and the morphine was reprecipitated again under exactly the same conditions The difference between the amounts of morphine recovered from the first and second reprecipitations is given as the loss in the second reprecipitation

In the last column is given the percentage (based on original weights and average titration) of morphine accounted for by the final titration and a correction for solubility of 0.5 mg. per Gm. of aqueous solution

In the working range series A and B the amounts of alkaloid accounted for by titration and solubility correction are in good agreement with the quantities taken At high dilution, as in series C, a slight increase in solubility loss is indicated

<sup>1</sup> Professor R. Eder of the Institute of Pharmacy, Zürich, reported similar results by a related method to the Commission of Experts in July 1935. The information was submitted to us privately.

TABLE I—REPRECIPITATION OF PURE MORPHINE

No	Morphine Taken Gm (93.44% Anhydrous Alkaloid)	Morphine by Titration %	Aqueous Solu- tion Gm	Loss by Reprecipitation 1st	Mg 2nd	% Accounted for by 0.5 Mg per Gm Correction
A1	0 6000	99 5	30	11 6	14 2	100 7
2	0 6000	100 0	30	10 2	14 2	100 9
3	0 6000	100 2	30	13 0	14 3	100 4
B1	1 2000	100 1	60	24 8		100 5
2	1 2000	100 2	60	26 2	31 3	100 2
3	1 2000	100 3	60	23 3	34 2	100 2
C1	1 0000	99 8	120	74 5	69 9	97 4
2	1 0000	99 9	120	63 2	75 5	98 0
3	1 0000	99 9	120	67 4	69 9	98 2

The precision of the method is borne out further by the results obtained in reprecipitating L N and U S P assay morphine where impurities were removed by the first and second reprecipitations and no loss occurred thereafter

*Solubility of Morphine in Mother Liquor from Lime Process*—In order to determine the solubility of morphine in the mother liquor from lime methods two sets of experiments were made using highly purified samples of morphine alkaloid

Three 1 2000 Gm samples of morphine alkaloid crystals A were placed in tared flasks, dissolved in a slight excess of 0.1N sulphuric acid, diluted and the excess acid titrated with 0.1N sodium hydroxide using methyl red indicator. The solutions were adjusted to 60.0 Gm and treated with 2 Gm calcium hydroxide. After shaking for 1 hour the solutions were filtered and 30.0 Gm of the filtrate (one-half aliquot) was treated with 2 cc U S P alcohol, 15 cc peroxide free ether and 1 Gm ammonium chloride A R. After keeping at room temperature for 3 hours with occasional shaking and in a refrigerator at 5° C over night, the precipitated morphine was filtered off, washed, dried, dissolved in neutral absolute methanol and titrated as in the L N method. The difference between one half the original amount of morphine taken and the final amount recovered was the loss due to solubility in 30 Gm of lime filtrate.

In a second group 1 2000 Gm samples of crystal alkaloid B were subjected to the same procedure except that the amounts of water and all other reagents were doubled. In this case the loss due to solubility was calculated for 60 Gm of lime filtrate.

The data are presented in Table II. In the final column is given the solubility in mg per Gm of lime filtrate used for precipitation.

TABLE II—SOLUBILITY OF MORPHINE IN LIME MOTHER LIQUOR

No	Morphine Taken Gm (by Titration)	Morphine Recovered Gm (by Titration)	Loss Gm	Solubility Mg per Gm
A1	1 1165	0 5419	0 0163	0 55
2	1 1166	0 5390	0 0193	0 64
3	1 1180	0 5405	0 0185	0 62
B1	1 1222	0 5305	0 0306	0 51
2	1 1222	0 5319	0 0292	0 49
3	1 1208	0 5319	0 0285	0 48
			Average	0 55

*Effect of Dissolving Assay Morphine in Methanol*—In order to determine the effect of drying the assay morphine and dissolving it in methanol as in the L N procedure two series of parallel experiments were made.

**Method I** One-Gm samples of pure morphine alkaloid crystals were dissolved in an equivalent amount of sulphuric acid, made up to 50 cc in a volumetric flask and shaken thoroughly. The solution was mixed with 2 Gm calcium hydroxide, shaken mechanically for 30–45 minutes, filtered and 25 cc of filtrate (one half aliquot) taken for precipitation. Two cc U S P alcohol, 15 cc peroxide free ether and 1 Gm ammonium chloride A R were added. After shaking for 15 minutes and keeping about 18 hours at 5° C, the assay morphine was filtered off on a

3G4 sintered glass funnel washed, dissolved in excess 0.1N sulphuric acid and titrated. The morphine found in 6 determinations, calculated on the basis of anhydrous alkaloid used, averaged 96.33% with an average deviation of 0.27%.

**Method II** The above experiments were repeated with the modification of drying the assay morphine on the funnel at 100°, dissolving in neutral absolute methanol and titrating as in the L. N. method. A slight insoluble residue remained on the filter. The morphine found in three determinations averaged 94.92% with an average deviation of 0.34%. This was 1.4% lower than by Method I showing contamination of the assay morphine by basic, methanol insoluble impurities, probably calcium carbonate.

**Effect of Meconic Acid**—By adding meconic acid to the morphine and carrying out the assay as in Method I, losses up to 3.4% were experienced probably due to coprecipitation of the alkaloid with calcium meconate which forms a gelatinous, voluminous precipitate.

TABLE III—COPRECIPITATION OF MORPHINE WITH CALCIUM MECONATE

Blanks by Method I Averaged 96.33%  $\pm$  0.27%

Meconic Acid Added Gm	Morphine Found (by Titration) %	% Loss by Coprecipitation
0.5	92.96	3.4
0.5	93.14	3.2
0.2	92.97	3.3
0.2	94.20	2.1

**Effect of Lactose**—Since lactose is used in diluting opium to pharmacopœia strength its effect on the assay was determined by Methods I and II.

TABLE IV—EFFECT OF LACTOSE IN RAISING THE ASSAY

Blanks by Method I Gave 96.33%  $\pm$  0.27%

Lactose Added Gm	Morphine Found (by Titration) %	Increase Due to Lactose %
0.2	97.60	1.3
0.5	97.77	1.4
0.5	96.89	0.6
1.0	98.26	2.0
1.0	99.91	3.6
1.5	98.85	2.5
2.0	98.91	2.6
Average 98.33		2.0

Blanks by Method II Gave 94.92%  $\pm$  0.34%

Lactose Added Gm	Morphine Found (by Titration) %	Increase Due to Lactose %
2.0	96.51	1.6
2.0	96.85	1.9
2.0	96.68	1.8
Average 96.68		1.8

The results in Table IV show that the presence of lactose raises the assay, perhaps due to formation of a basic complex with calcium which contaminates the assay morphine. The error is not avoided by dissolving the morphine in methanol. Probably other substances behave similarly.

**Oxidation and the Effect of Pseudomorphine**—In order to determine whether morphine is oxidized appreciably in lime water by oxygen a stock solution of morphine sulphate was prepared and 50 cc. portions were assayed by Method II. The mixtures with lime were shaken and allowed to stand for various lengths of time in atmospheres of nitrogen and oxygen. As shown in Table V, it was found that no loss occurred in an atmosphere of nitrogen and the solutions remained light in color but in an atmosphere of oxygen there was a marked loss of morphine, the solution

became dark and the precipitated alkaloid contained a dark, methanol insoluble impurity. The percentage recovered was figured on the basis of the average of the first and second determinations.

TABLE V—OXIDATION OF MORPHINE BY OXYGEN IN LIME SOLUTION

Total Time in Lime Hrs	Time Shaken Hrs	Atmosphere	Color of Solution	Morphine Recovered (by Titration) %
0 5	0 5	Air	Light	99 9
0 5	0 5	Air	Light	100 3
24 0	2 0	Nitrogen	Light	99 9
24 0	2 0	Oxygen	Dark	90 3
24 0	2 0	Oxygen	Dark	90 3
48 0	2 0	Nitrogen	Light	100 3
48 0	2 0	Oxygen	Dark	60 3
48 0	2 0	Oxygen	Dark	63 6
48 0	2 0	Oxygen	Dark	58 8

It is concluded, therefore, that prolonged exposure of alkaline morphine solutions to oxygen results in loss by oxidation. The loss during an ordinary assay, where the time of exposure is less than one hour, is probably not significant.

Since pseudomorphine is the most common oxidation product of morphine its fate in a lime assay was investigated. Pseudomorphine was prepared by oxidation of morphine with potassium ferricyanide (21). In one experiment 0.5 Gm. pseudomorphine sulphate was treated as in Method I, morphine being absent. Only a trace of precipitate was obtained by adding ammonium chloride to 25 cc. of filtered lime solution, and its titre, calculated as morphine, amounted to 26 mg. In another experiment by Method I using 1 Gm. morphine alkaloid, 0.5 Gm. pseudomorphine alkaloid was added to the lime solution. The recovery of morphine was 96.66% compared to blanks containing no pseudomorphine of 96.33%. It is concluded, therefore, that pseudomorphine contaminates the assay morphine from a lime process only to a limited extent.

INVESTIGATION OF THE LEAGUE OF NATIONS METHOD <sup>1</sup>

The sample was a mixture of Jugoslavian and Turkish opiums which lost 11.74% moisture on drying at 60–70° and was ground to pass a 50 mesh sieve.

The moisture of the ground opium was determined by drying 1-Gm. samples at 105° in an electric oven<sup>2</sup> (Table VI).

TABLE VI DETERMINATION OF MOISTURE IN OPIUM

	Sample No 1	Sample No 2
Loss after 3 hours	4.22%	4.12%
Loss after 4 hours	4.49%	4.59%
Loss after 24 hours	4.78%	4.87%
Loss after 48 hours	5.36%	5.32%

Extractives were determined on three occasions by the method prescribed in the L. N. method (Table VII).

TABLE VII—DETERMINATION OF EXTRACTIVES IN OPIUM

Set No 1	46.1%	46.1%
Set No 2	44.9%	44.6%
Set No 3	47.0%	47.1%
Average 46.2%		

<sup>1</sup> A copy of the method, dated Leyden, October 17, 1933, was received from H. J. Anslinger, United States Commissioner of Narcotics.

<sup>2</sup> According to Baggesgaard Rasmussen and Co-Workers (15) the loss of weight is most reproducible by heating at 100° at 1–2 mm.

Nine determinations of morphine were made in groups of three by the method prescribed by the Commission. In order to adhere to conditions used throughout this work the precipitation was carried out by keeping the mixture at room temperature for about 4 hours with occasional shaking and then in a refrigerator at 5° C over night. The results in Table VIII, given as per cent anhydrous morphine in the ground opium sample, were calculated by the L N formula, which includes a solubility correction of 28.5 mg, using 5.3% as the moisture and 46.2% as the extractives in the opium. The amount of morphine indicated by titration, calculated as anhydrous base, is tabulated in the next column.

The titrated solutions of assay morphine were saved for investigation of the purity. The amounts of extractives being known from previous determinations, all the lime extract of opium in excess of 25.0 Gm used for precipitation of morphine was saved with the marc, acidified and worked up as described in a later paragraph. The filtered mother liquor and ether washings from the assay morphine were kept separate from washings with morphinated water, acidified and saved for determination of unprecipitated morphine.

*Purity of the Assay Morphine*—The purity of the assay morphine was determined by reprecipitation. The titrated solutions of assay morphine, containing 5 drops excess acid, were combined in groups of three and evaporated to a small volume on the steam-bath under an electric fan. The concentrate was transferred to a tared Erlenmeyer flask and made up to 45 Gm. The transfers were made quantitatively by use of several small portions of hot water. Three cc U S P alcohol, 22.5 cc peroxide free ether and 5.5 cc 1N ammonia were added. The process was completed as previously described under reprecipitation of pure morphine. Further reprecipitations were made in the same way. The amount of morphine accounted for by titration and solubility correction (0.5 mg per Gm of aqueous solution) is given in Table VIII expressed as a percentage of the original morphine indicated by titration. Experience has shown, and it is indicated by the data, that after two or three reprecipitations the assay morphine is pure and no further loss occurs in subsequent precipitations.

TABLE VIII—PURITY OF L N ASSAY MORPHINE

No	Results of L N Assays	Morphine Isolated (Original Titration)	Purity of Isolated Morphine by Reprecipitation			
			1st	2nd	3rd	4th
1	16.43%	0.3619 Gm				
2	16.41%	0.3614 Gm	98.3%	96.6%	96.2%	96.4%
3	16.53%	0.3642 Gm				
4	16.31%	0.3591 Gm				
5	16.31%	0.3591 Gm	97.5%	96.3%	96.0%	
6	16.20%	0.3563 Gm				
7	16.31%	0.3591 Gm				
8	16.37%	0.3605 Gm	97.3%	96.3%	96.3%	
9	16.43%	0.3619 Gm				
Average 16.37% = 0.07%		0.3604 Gm				96.2%

Average amount of pure morphine isolated per assay =  $0.3604 \times 0.962 = 0.3467$  Gm

*Unprecipitated Morphine*—In order to determine the amount of morphine remaining in the mother liquor, for which a correction of 28.5 mg is allowed in the L N procedure, the filtrates and ether washings from the original nine L N assays were kept separate from the washings with morphine water, combined in groups of three and acidified with sulphuric acid. The calcium sulphate was filtered off on a sintered glass funnel and washed several times with small portions of water. The by alkaloids were separated and the morphine isolated by applying the "shake out" method of Stucki (8). The acid solution was extracted twice with 50 cc portions of a 3 to 1 mixture of chloroform and isopropanol which removed some gums. The extract was washed twice with 10 cc of 0.1N sulphuric acid to recover any morphine and the washings were added to the main portion. This was made alkaline to phenolphthalein with 10N sodium hydroxide and 2 cc were added in excess. The by alkaloids were extracted with 75.75 and 50 cc portions of chloroform-isopropanol, the extracts being washed twice with 10 cc of 0.1N sodium hydroxide and the washings returned to the main portion. Three grams ammonium sulphate were added and

the morphine was extracted with 75, 75, 75 and 50 cc of chloroform-isopropanol. These extracts were filtered and evaporated to dryness. The residue was a dark, varnish-like gum which was dissolved in absolute methanol and titrated, a precipitate formed near the neutral point. The amounts of crude morphine found are given in Table IX.

The titrated solutions were combined, evaporated and the morphine reprecipitated from 40 Gm of aqueous solution as described for pure morphine. The amounts of morphine accounted for (by titration and solubility) after each reprecipitation are given in Table IX.

TABLE IX—MORPHINE UNPRECIPITATED FROM MOTHER LIQUOR

No	Crude Morphine Isolated, Gm	1st	Pure Morphine by Reprecipitation 2nd	3rd
1-3	0 100			
4-6	0 093	0 214 Gm	0 177 Gm	0 148 Gm
7-9	0 100			

The precipitates from the first and second reprecipitations were deeply colored, slimy and left black residues when dissolved in absolute methanol. The final product was granular and fairly light in color. Although the precision of this determination was probably affected somewhat by the nature and amounts of impurities, the result is believed to be approximately correct. The final quantity, 0 148 Gm, was the anhydrous morphine dissolved in the mother liquors from nine L. N. assays. Therefore, the solubility per assay was 0 0164 Gm compared to 0 0285 Gm allowed as an arbitrary correction in the Commission's method. The amount found is equivalent to a solubility of 0 66 mg per Gm of aqueous solution which is in fair agreement with the loss of 0 55 mg per Gm suffered when pure morphine was subjected to a lime assay. As shown by Hollman (2) the presence of gums and other substances in the solution affects the solubility, so the amount of unprecipitated morphine may vary with different opium extracts.

*Morphine in the Marc*—For the purpose of determining whether or not all morphine was in solution at the time the aliquot was taken in the L. N. method, the lime marc and all liquor in excess of the 25 Gm used for precipitating the morphine were washed into a beaker and acidified to bromphenol blue with sulphuric acid. The volume was about 200 cc. After digesting for 1 hour at 80° it was filtered on a Büchner funnel by suction and the residue was extracted twice more with 100-cc portions of acidified water. The quantitative isolation and purification of this morphine proved difficult, the marcs from the first six assays being used in working out a satisfactory method. It was finally accomplished by clarifying the solution by a method similar to that devised by Buchbinder<sup>1</sup> and removing the by alkaloids and isolating the morphine according to the method of Stucki (8).

The acid extract, amounting to about 400 cc, was evaporated to 100 cc and transferred quantitatively with hot water to a tared 200-cc volumetric flask. Forty grams of powdered sodium chloride was dissolved in the liquor. The solution was neutralized with 10% sodium hydroxide and 20 cc was added in excess. Twenty cubic centimeters saturated barium chloride solution were added. Then the flask was filled to the mark with water, shaken vigorously and weighed. The solution was filtered and 150 cc were used for isolation of the morphine. Complete data were taken for calculation of the aliquot which was found to be 0 760 and 0 755 for two samples when precipitated solids were taken into account. The average aliquot was applied to the third sample. It is recognized that coprecipitation of morphine may occur in the clarification step, hence the amount of morphine found in the marc should be considered a minimum figure.

By alkaloids were removed by extracting the alkaline filtrate three times with 75 cc portions of a 3 to 1 mixture of chloroform and isopropanol. The organic layers were washed with two 10 cc portions of 0 1N sodium hydroxide to recover any morphine and returned to the main aqueous layer. This was acidified with hydrochloric acid, made alkaline with ammonia and the morphine extracted with 75, 75, 50 and 50 cc of chloroform-isopropanol. The solvent layers were filtered, evaporated to dryness and the residue dissolved in absolute methanol and titrated. The amounts of crude morphine isolated from the marcs, taking into account the aliquot, are given in Table X. The titrated solutions were evaporated together and reprecipitated as previously described. The purity, based on the original amount found by titration, is given in Table X.

<sup>1</sup> Private communication from the Bureau of Narcotics.



Using the data from Table X the average amount of morphine remaining in the excess liquor and marc was  $0.297 \times 0.883 = 0.2623$  Gm

TABLE X—MORPHINE EXTRACTED FROM LIME MARC

No	Crude Morphine in Marc	1st	Purity by Reprecipitation 2nd	3rd
7	0.302 Gm			
8	0.289 Gm	89.8%	88.6%	88.3%
9	0.301 Gm			
Average	0.297 Gm			

The total amount of solution originally employed in the L. N. assay is the sum of the water moisture in the opium and extractives

Water	40.0 Gm
Moisture in opium = $5.3\% \times 4$	= 0.2 Gm
Extractives = $46.2\% \times 4$	= 1.9 Gm

Total Solution	42.1 Gm
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Twenty-five grams of this, the aliquot, yielded 0.3467 Gm pure morphine by precipitation and the mother liquor contained 0.0164 Gm or a total of 0.3631 Gm. Then the excess liquor,  $42.1 - 25.0 = 17.1$  Gm would contain  $\frac{17.1 \times 0.3631}{25.0} = 0.2484$  Gm. Since the excess liquor and marc

yielded 0.2623 Gm pure morphine the marc held  $0.2623 - 0.2484 = 0.0139$  Gm morphine in the undissolved state, probably coprecipitated with calcium meconate. This amount, which is 2.2% of the total morphine in the opium, is in good agreement with the loss by coprecipitation (2-3%) when a solution of pure morphine and meconic acid was subjected to a lime assay.

*Check of Solubility Corrections*—In order to check the precision of solubility corrections applied in the foregoing reprecipitations of morphine isolated from various parts of the L. N. process, the mother liquors from reprecipitation of the assay morphine and that obtained from the original L. N. mother liquors were acidified and saved.

The amounts of morphine which had been allowed were

4 Mother Liquors from assay morphine 1-3	0.0900 Gm
3 Mother Liquors from assay morphine 4-6	0.0675 Gm
3 Mother Liquors from assay morphine 7-9	0.0675 Gm
Morphine isolated from L. N. Mother Liquors 1-9, and mother liquors from its reprecipitation	0.1484 Gm
Total morphine allowed	0.3734 Gm

These liquors were combined, made ammoniacal and extracted 4 times with 100 cc portions of chloroform isopropanol. The extract was concentrated to about one-half its volume and the morphine was extracted with two 50 cc portions of 0.1N sodium hydroxide and washed twice more with 30 cc of water. The combined alkaline extracts were treated with 1 Gm ammonium sulphate to liberate the morphine which was extracted with four 100 cc portions of the immiscible solvent. The extracts were filtered and evaporated to dryness. The residue was a black, varnish-like gum, the titration of which was only approximate due to the color of the solution. The titre indicated 0.448 Gm morphine. The first reprecipitation accounted for 0.379 Gm morphine and the second for 0.347 Gm of alkaloid of good quality. This is in good agreement with the quantity (0.3734 Gm) assumed to have been present.

*Summary of Results on League of Nations Method*—The pure morphine found in the various parts of the L. N. assay may be summarized as follows

Precipitated from 25.0 Gm filtrate	0.3467 Gm
Dissolved in mother liquor	0.0164 Gm
In excess liquor	0.2484 Gm
Undissolved in marc	0.0139 Gm
Total from 4 Gm opium	0.6254 Gm
Per cent morphine in opium	15.63

The difference of 0.74% between this figure and 16.37%, the average result of the original 9 assays, is made up of errors due to impurities in the assay morphine, incorrect solubility correction and coprecipitation of morphine in the lime marc

#### EXPERIMENTS ON U S P X AND ROSIN METHODS

The U S P X and Rosin methods are closely related and are subject to the same inherent errors as the improved lime method proposed by the League of Nations Commission as regards coprecipitation of morphine in the lime marc and impurities in the assay morphine. No correction is applied in these methods for the solubility of morphine in the mother liquor, which is probably of the same magnitude as in the L N procedure. The opium is extracted (exhaustively) with water which is sometimes incomplete due to insufficient natural acidity to form salts with all alkaloids. The concentrated extract is treated with lime and an empirical aliquot is taken by volume in the U S P method and by weight in the Rosin method without taking into consideration the solids precipitated by lime. This last-mentioned error and the purity of U S P assay morphine have been examined experimentally.

*Precision of the Aliquot*—Four 8 Gm samples of opium were extracted and evaporated as in the U S P X method. The concentrates were combined in a 250 cc volumetric flask and made up to the mark. In this solution the concentration of extractives was essentially the same as in the solution used for treatment with lime in the U S P X and Rosin methods.

Three gram samples of this solution were evaporated and the residue dried at 105° to determine solids. Fifty-cubic centimeter samples were measured into tared flasks and weighed. Four grams powdered calcium hydroxide were added, the mixture shaken for 1 hour and filtered. Twenty-five-cubic centimeter portions of filtrate were measured into tared flasks and weighed. Further 3.00 Gm samples of filtrate were evaporated and dried to determine solids. From this data, given in Table XI, the actual aliquot was calculated and compared with the empirical aliquots of the U S P X and Rosin methods.

TABLE XI—PRECISION OF EMPIRICAL ALIQUOTS

	Sample No 1	Sample No 2
(a) Solids from 3.00 Gm liquor	0.2313 Gm	0.2261 Gm
(b) Wt of 50.00-cc liquor	50.98 Gm	50.97 Gm
(c) Wt of 25.00-cc lime filtrate	25.42 Gm	25.44 Gm
(d) Solids from 3.00 Gm filtrate	0.1646 Gm	0.1650 Gm

$$\text{Actual Aliquot} = \frac{c - d \left( \frac{c}{b} \right)}{b - a \left( \frac{b}{c} \right)} = \quad 0.5107 \quad \quad 0.5101$$

Average 0.5104

$$\text{Aliquot by volume (U S P X)} = \frac{25}{50} = 0.5000$$

$$\text{Aliquot by weight (Rosin)} = \frac{c}{b} = \quad 0.4986 \quad \quad 0.4991$$

Average 0.4989

Therefore, the error introduced by taking the aliquot by volume would be

$$\frac{0.5104 - 0.5000}{0.5104} \times 100 = 2.04\%$$

Similarly the aliquot taken by weight would be in error 2.26%. It is evident that considerable solids were precipitated by lime, the percentage being 7.63 before and 5.49 after lime treatment.

The above experiment on precision of the aliquot was repeated on another sample of opium which yielded an extract containing 7.32% solids before and 5.81% after lime treatment. The actual aliquot was 0.5072 instead of 0.5000 as assumed in the U S P X aliquot by volume. It is obvious that other opiums may contain considerably different amounts of water extractable and

lime precipitable materials. Then the magnitude of the error would be changed, but it would always raise the assay since solids are thrown out of solution by the lime.

Experiments on the empirical aliquot used in the B P 1932 assay showed that 52 cc of lime filtrate represented 5 011, 5 012, 5 009, 5 012, average 5 011 Gm opium instead of the assumed 5 000 Gm or an error of 0 22%. It must be emphasized however, that the error would vary markedly with moisture and extractives in the opium.

*Purity of U S P Assay Morphine*—Seven U S P X assays were carried out in the official manner up to the filtration of the assay morphine. This was collected on a sintered glass funnel, washed as usual, dried at 100° and weighed. The amounts obtained were 0 700, 0 690, 0 696, 0 707, 0 672, 0 670 and 0 702 Gm. These were combined, thoroughly mixed and portions examined by the following methods.

Three 0 5 Gm samples (Table XII) were titrated and purified by reprecipitation in the presence of alcohol and ether as previously described. Corrections were applied for loss due to solubility and the purity was calculated on the basis of the original titration.

TABLE XII—PURITY OF U S P X ASSAY MORPHINE BY REPRECIPITATION

Wt. Taken	Anhydrous Morphine Indicated by Titration Gm	Purity by Reprecipitation	
		1st	2nd
0 5000	0 4663	94 1%	92 1%
0 5000	0 4677	94 4%	
0 5000	0 4663	93 5%	90 6%

Two 1-Gm samples were dissolved in absolute methanol as in the L N method and titrated. The solutions were evaporated and transferred to a separatory funnel, added 20 cc 10N sodium hydroxide and extracted with 40, 30- and 30 cc portions of a 3 to 1 mixture of chloroform and isopropanol to remove by alkaloids. The extracts were washed counter currentwise with a little water to recover any morphine. The chloroform layers containing non phenolic alkaloids were combined, evaporated, the residue dissolved in neutral methanol and titrated. The morphine was precipitated from the aqueous layers in the presence of alcohol and ether, determined in the usual manner, and a correction of 0 5 mg per Gm of solution added for solubility. The results were calculated as percentage of the original titration and are presented in Table XIII. Further loss in titratable material due to water soluble impurities is indicated in the last column.

TABLE XIII—IMPURITIES ACCOMPANYING U S P ASSAY MORPHINE

Wt. Taken Gm	Anhydrous Morphine Indicated by Titration Gm	Non Phenolic Alkaloids	Morphine Recovered	Water-Soluble Impurities
1 0000	0 9298	3 83%	91 5%	4 67%
1 0000	0 9326	3 52%	92 3%	4 18%

It is concluded, therefore, that the titration of U S P assay morphine from this opium included 8-9% impurities of which 3 6% were non phenolic alkaloids and 4 4% were water soluble, basic substances.

U S P assay morphine was prepared from another sample of opium and purified by reprecipitation. The purity was calculated as a percentage of the original titration (Table XIV).

TABLE XIV—REPRECIPITATION OF U S P X ASSAY MORPHINE

Wt. Taken Gm	Anhydrous Morphine Indicated by Titration Gm	Purity by Reprecipitation %		
		1st	2nd	3rd
1 0000	0 9168	96 8	96 6	96 6
1 0000	0 9154	97 0	96 8	96 7
1 0000	0 9154	97 5	96 8	96 8

In this case the assay morphine was much purer (96 7%) than that yielded by the previous sample of opium (92%) by the same assay method.

## SUMMARY AND CONCLUSIONS

The behavior of pure morphine in a lime assay has been studied and procedures have been described for investigating methods of opium analysis. The principal lime methods, including the one proposed by the Commission of the League of Nations, have been thoroughly investigated. The sources of error, and their magnitude in particular cases, have been pointed out. It has been found that

- (a) Morphine is coprecipitated with calcium meconate
- (b) The solubility correction used in the League of Nations method is approximately double the amount of morphine that can be extracted from the mother liquor, and is double the loss suffered by pure morphine when it is substituted for opium in the assay
- (c) The assay morphine is contaminated by basic impurities, including by-alkaloids and calcium salts
- (d) Substances such as lactose raise the assay
- (e) Empirical aliquots are inaccurate

The errors of lime methods vary depending upon the type of opium. It has been our experience that the results are generally too high. It is concluded that the ultimate solution of the problem does not lie in the direction of lime methods.

We are now engaged in the study of methods based on extraction with immiscible solvents which we expect to make the subject of a later paper. Such methods offer many desirable features but in their present form appear to be unsatisfactory in certain details such as size of sample, the nature of the immiscible solvent and the purity of the assay morphine.

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## THE BIOASSAY OF VERATRUM VIRIDE \*<sup>1</sup>

BY B V CHRISTENSEN<sup>2</sup> AND A P MCLEAN

Although the U S P X recognizes no chemical or biological assay for *Veratrum viride*, it is a well-known fact that the preparations of this drug vary greatly in potency (1, 2) This variation in potency and the lack of a satisfactory assay method seem to be the only explanation for the fact that this drug has been almost completely discarded

A chemical assay has been suggested (3, 4), but since the activity of *Veratrum viride* is due to a number of alkaloids which differ qualitatively and quantitatively in action (5) it would appear that a chemical assay would not be sufficient This has been pointed out by several workers (1, 6)

Houghton and Hamilton (7) reported a biological assay of *Veratrum viride* based upon the M L D per Gm body weight of frog Pilcher (2) did further work with this method and concluded that for all practical purposes the frog assay appeared to be satisfactory

Rowe (8), in reporting a biological assay based upon the M L D for white mice, made the following comment on the indefinite end-point of the frog method and the length of time required "A whole series of frogs given graded doses may be found fifteen hours later to be more dead than alive, but still they are not dead and even a skilled technician hesitates about drawing any conclusions" In our experience the mouse method has the same objection The advantages claimed for the mouse method were that fewer animals were needed and that the assay required less time Pilcher (2) used an M L D for guinea pigs but preferred the frog method

*Veratrum viride* is a centrally acting cardiac depressant In therapeutic doses it has a selective stimulating action on the vagus nerve (9) It has long been known that large doses cause emesis Some workers claim that the emesis is central, while some claim that it is local Hanzlik (10) states that the emesis of *Veratrum* is the result of local irritation, and that it is produced by intraperitoneal but not by intravenous injections

\* Scientific Section A Ph A Portland meeting, 1935

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Since it appears that a chemical assay for *Veratrum viride* is not sufficient, and since the biological assays presented require long periods of observation and lack definite and easily observed end-points, it is evident that a more satisfactory assay method is needed. In view of the fact that *Veratrum* is a medullary stimulant, that the vomiting centers are located in the medulla and that emesis usually results from the administration of large doses, it is quite probable that this emesis is a result of the central medullary stimulation, that it is a manifestation of the desired pharmacological action and that it would furnish a satisfactory basis for a biological assay. We have found that small and very definite doses of *Veratrum* consistently produced emesis upon intravenous injection in pigeons. We also found, in our first experiments, that we could determine the emetic dose of a tincture within a range of 0.005 cc per Kg body weight of pigeon. This accuracy, the fact that emesis results within only a few minutes after administration, that the technique was very simple, that the animals were not killed and could be repeatedly used, suggested this as an ideal assay method.

In this preliminary work the potencies of six tinctures of *Veratrum viride*, U S P X, were compared, using the average minimum emetic dose for pigeons as the basis for comparison. Three of these, No 102, No 104 and No 105, were commercial tinctures prepared by reliable manufacturers. Two of these, No 102 and No 104, were claimed by the manufacturer to assay 0.1 per cent total alkaloids. The other tinctures, No 110, No 111 and No 112, were prepared by the U S P X process from the crude drug obtained from reputable drug houses.

In order to compare the effect of the method of administration upon the emetic dose, the M Em D of one tincture, No 112, was also determined by intraperitoneal injection. The intravenous method seemed much superior and was, therefore, used with the six preparations included in this work.

*The minimum emetic dose was considered as the smallest dose, expressed in cc of the tincture per Kg body weight, which would produce emesis within fifteen minutes in approximately 75 per cent of the pigeons injected.*

The method used was very similar to the one proposed by Hanzlik (10) for estimating the potency of digitalis. Adult pigeons weighing, roughly, from three to four hundred grams were used. Freshly prepared dilutions (1 to 20 and 1 to 40) of the tincture in physiological salt solution were injected into the wing veins, and the pigeons placed in individual cages and observed for a period of fifteen minutes. A longer period of observation was found to be unnecessary. The emesis which resulted, usually in from two to five minutes, was of short duration and was characterized by a downward craning movement of the head and a convulsive flapping movement of the wings. There was usually an expulsion of gravel or mucus.

In determining the emetic dose for each preparation two doses of a wide range were first given to "bracket" the emetic dose, and then by a series of injections of doses within this range the minimum emetic dose was approached. Since the doses well below the emetic dose failed to produce emesis in almost every case and the doses above the emetic dose in all but one case, No 110, caused emesis, only the emetic doses and the doses just below the emetic dose have been included in the tables.

The results obtained in determining the average minimum emetic dose of six tinctures of *Veratrum viride* intravenously, the results of one determination using

intraperitoneal injection, and a comparison of the potencies of the six tinctures based upon this method, are presented in the following tables

TABLE I—THE AVERAGE MINIMUM EMETIC DOSE OF SIX TINCTURES OF VERATRUM VIRIDE

Preparation Number	Dose Cc /Kg	Number of Injections	Emesis	No Emesis
102	0 060	7	1	6
	0 065*	11	10	1
104	0 050	5	0	5
	0 060*	11	8	3
105	0 020	10	3	7
	0 030*	7	7	0
110	0 020	14	7	7
	0 025*	5	5	0
	0 030	8	6	2
111	0 020	10	4	6
	0 030*	7	6	1
112	0 020	11	4	7
	0 030*	6	6	0

\* Minimum Emetic Dose

TABLE II—A COMPARISON OF THE AVERAGE MINIMUM EMETIC DOSE OF THE SIX PREPARATIONS TESTED ALSO, A COMPARISON OF THE POTENCIES OF THE PREPARATIONS AS INDICATED BY THE DIFFERENCE IN THE SIZE OF THE INTRAVENOUS EMETIC DOSE FOR PIGEONS

(For Convenience of Comparison, Preparation 102 Is Indicated as Having a Potency of 100 Per Cent )

Preparation	M Emetic Dose Cc /Kg	Comparative Potency
102	0 065	100%
104	0 060	108%
105	0 030	217%
110	0 025	260%
111	0 030	217%
112	0 030	217%

TABLE III—THE INTRAPERITONEAL EMETIC DOSE OF PREPARATION No 112

(This Is the Only Case in Which Intravenous Injection Was Not Used )

Dose Cc /Kg	Number of Injections	Emesis	No Emesis
0 040	4	0	4
0 060*	4	3	1

\* Minimum Emetic Dose

#### DISCUSSION AND CONCLUSIONS

As shown by Table II, there was a wide variation in the potencies of the tinctures tested as indicated by the difference in the size of the intravenous dose necessary to produce emesis in pigeons. Preparations No 102 and No 110 (Tables I and II), prepared by the U S P X process, showed a variation in potency of more than 100 per cent.

Although the time required for emesis to take place was not given in the preceding tables, the average time required for emesis following intravenous injections was about five minutes. In no case did emesis occur after fifteen minutes.

For the purpose of comparing methods of administration, the minimum emetic

dose of preparation No 112 was determined by intraperitoneal injection (Table III) It was found that approximately twice the intravenous dose (Table I) was required to produce emesis when the drug was administered by this method It was also found that approximately twenty minutes was required for emesis to take place following intraperitoneal injections

No attempt was made to determine the seat of the emetic action, however, the following data indicate that emesis is the result of a central action rather than the result of local irritation as claimed by Hanzlik (10) 1 Intravenous injections of the drug produce emesis usually in from two to five minutes 2 About twenty minutes is required for an emetic action to take place when the drug is administered intraperitoneally 3 The intravenous emetic dose is much smaller than that dose required to produce emesis when injected intraperitoneally 4 The consistency obtained would hardly have been possible had the emetic action been due to local irritation The fact that *Veratrum viride* is known to act upon the medullary center and that the vomiting centers are located in this part of the brain further substantiate these indications

From the consistency obtained in this preliminary work it appears that the minimum emetic dose for pigeons might furnish a satisfactory basis for a biological assay of this drug, however, further work is being done in an attempt to definitely determine its reliability

If it can be shown that the pigeon emesis method gives a reliable measure of the desired pharmacological activity of *Veratrum viride*, it would have the following attributes of a good biological assay method 1 A very definite and easily recognized end-point 2 Economy The pigeons may be repeatedly used 3 Little time is required The maximum period of observation is fifteen minutes With the frog method, which seems to be in greatest favor, this period may exceed twenty-four hours 4 An accuracy of within 10 per cent 5 Simplicity The technique is very simple and does not require the aid of an assistant

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#### STORY OF LIFE AT TEXAS CENTENNIAL

"The Story of Life," a cooperative exhibit created at a cost of \$100,000 00, which will occupy more than 10,000 square feet in the great hall of the Federal Government, promises to be one of the outstanding attractions of the Texas Centennial Exposition

Dr E H Cary, former president of the American Medical Association, is coöperating with officials of the United States Public Health Service and the Smithsonian Institution Seven of the leading universities of Texas and the medical profession of State and Nation have joined with these agencies to present the display Pharmacists participate in the exhibit



PHENOLIC ESTERS OF *p*-METHOXYCINNAMIC ACID \*

BY C W SONDERN

The acid used in the experiments here described was obtained from its natural ethyl ester separated from the oil of *Kampferia Galanga* L. This oil had been prepared at the Botanical Garden at Buitenzorg, Java, to the Director of which thanks are due for his kind cooperation. The oil had been distilled for the purpose of securing a somewhat larger amount of *n*-pentadecane, first isolated by van Romburgh. However, since the oil consists largely of the handsomely crystallizable ethyl ester of *p*-methoxycinnamic acid it seemed desirable to use this material for further study of its derivatives.

*Guaiacol Ester*—The method followed was the one successfully employed by P. A. Foote (1). A mixture of 5 Gm. of acid, 3.5 Gm. of liquid guaiacol and 2.4 cc. of phosphorus trichloride in 80 cc. of anhydrous toluene was refluxed gently first in a water-bath for an hour, then in an oil-bath for another hour. The toluene having been removed by distillation under diminished pressure, the reaction product was washed with 5% aqueous KOH to remove any excess acid or phenol. The residue when recrystallized from alcohol yielded 4.5 Gm. (57% of theoretical yield computed on the acid used) of a product melting at 102–103°. Upon saponification, duplicate determinations yielded values of 181 and 188. The theoretical saponification value is 186. The acid regenerated from the saponification liquid melted at 170°, the m. p. of *p*-methoxycinnamic acid. Guaiacol was identified in the saponification liquid by means of the ferric chloride test.

*$\alpha$ -Naphthol Ester*—The same process applied to  $\alpha$ -naphthol yielded a crystalline product, but the yield was low, viz., 22%. Recrystallized, it melted at 102°. Upon saponification, duplicate determinations yielded 197 and 180, respectively. The computed S. V. is 184. The regenerated acid melted at 170°. The  $\alpha$ -naphthol recovered melted at 90°, the recorded m. p. being 94°, and gave a positive test with ferric chloride.

*Resorcinol Esters*—An attempt to prepare resorcinyl paramethoxycinnamate using phosphorus trichloride as the condensation agent resulted in the formation of large amounts of resinous by-products. To remedy this, phosphorus pentoxide (2) was used.

(I) Three and three-tenths grams of the acid and 2.1 Gm. of resorcinol were dissolved in approximately 60 cc. of toluene together with 1.2 Gm. of phosphorus pentoxide. The mixture was refluxed on an oil-bath for two hours and then the toluene was distilled off under diminished pressure. The product was washed with 5% aqueous KOH to remove any free acid, phenol or mono-ester. The residue, crystallized from hydro acetone solution, yielded 0.5 Gm. of a product melting at 172–173°. In order to examine this further a larger quantity of material was prepared.

(II) Five grams of *p*-methoxycinnamic acid and 3.2 Gm. of resorcinol were dissolved in approximately 80 cc. of toluene together with 2 Gm. of phosphorus pentoxide. The mixture was refluxed on an oil bath for two hours and then the toluene was distilled off under diminished pressure. The residue in the distilling flask was washed with 5% aqueous KOH and the product removed and dried in a desiccator over CaCl. When crystallized from a hydro acetone solution and dried it yielded a light orange crystalline product weighing 1.51 Gm. and melting at 171–172°.

The products from the two experiments were combined and recrystallized. Yield 1.84 Gm., m. p. 173–173.5°. Duplicate saponifications on this product

\* From the Laboratory of Edward Kremers, Madison Wis.

yielded values, 259 and 256 The theoretical saponification value for the di-ester is 261 Analysis of the saponification liquor yielded *p*-methoxycinnamic acid m p 170° and resorcinol m p 115°

An attempt was made to isolate the mono-ester from the alkaline washings obtained from the above experiments

The alkaline solution was carefully neutralized with 10% HCl and the neutral solution extracted several times with ether in order to remove any unreacted resorcinol along with the mono-ester When the aqueous solution was acidified a small amount of impure *p*-methoxycinnamic acid was recovered The ether-soluble fraction was concentrated and the product dried A few red crystals melting at 135–137° (with decomposition) were obtained The quantity of this product was too small to permit its characterization

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### THE ADDITION OF STRONG HYDROGEN PEROXIDE IN THE DETERMINATION OF NITROGEN IN ORGANIC COMPOUNDS \*

BY CHARLES F POE AND BARTLETT T DEWEY

#### INTRODUCTION

The amount of nitrogen in some organic compounds is determined successfully by the Gunning or Kjeldahl methods These two methods have advantages over the Dumas method because of the ease of manipulation and the use of less expensive apparatus However, the distillation methods are subject to certain limitations because the results in the analysis of compounds containing such groups as nitro, nitroso, azo, azoxy, etc., are inconsistent Many organic compounds also require a very long period of heating in order to liberate all of the nitrogen

The investigation reported in this communication was undertaken in order to determine accurately the amount of time saved and the accuracy obtainable when thirty per cent hydrogen peroxide was used in the determination of nitrogen In the last few years, a number of investigators (1–10) have found hydrogen peroxide to be a valuable oxidizing agent in the decomposition of organic substances, because it hastens the process of digestion and cuts down foaming

#### EXPERIMENTAL

The method employed in the investigation reported in this paper was the Gunning modification of the original Kjeldahl method, which is official with the Association of Official Agricultural Chemists (11) Twenty-five hundredths gram of the organic compound was placed in each of two digestion flasks with ten Gm of nitrogen free potassium sulphate and twenty cc of concentrated sulphuric acid The contents of both flasks were digested over electrically heated plates, all units of which were of the same construction and gave the same amount of heat During the digestion, one cc of a 30 per cent solution of hydrogen peroxide was added to one of the flasks at intervals of ten minutes The contents of the other flasks were allowed to digest without the addition of the hydrogen peroxide Each sample was heated until the liquid in the flask was light

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\* Scientific Section, A PH A, Portland meeting, 1935

straw color This color, in the case of the amino compounds was found to indicate the point at which complete conversion of nitrogen into ammonium acid sulphate was effected

In Table I are given the results of the analysis of a number of organic amino compounds The study of the above-mentioned table demonstrates that both the Gunning method and the modification making use of strong hydrogen peroxide give results which are very accurate The addition of hydrogen peroxide in no way affected the accuracy of the analysis, but did shorten considerably the time required for the completion of the determination The time saved by the use of the strong hydrogen peroxide varied from 37 to 84 per cent—the average saving being 68 per cent

TABLE I—DETERMINATION OF NITROGEN IN AMINO COMPOUNDS

Organic Compounds	Time in Minutes Plus $H_2O_2$		Per Cent Nitrogen Plus $H_2O_2$		Theoretical	Time Saved in Per Cent
	Gunning		Gunning			
Acetanilid	89	56	10 26	10 21	10 37	37 1
Acetphenetidin	119	34	7 61	7 63	7 70	71 4
<i>o</i> -Aminobenzoic Acid	60	30	10 15	10 16	10 21	50 0
<i>m</i> Aminobenzoic Acid	61	32	10 18	10 13	10 21	47 5
<i>p</i> Aminobenzoic Acid	60	32	10 20	10 16	10 21	46 7
alpha Amino <i>n</i> butyric Acid	123	34	13 57	13 54	13 58	72 4
alpha-Aminocaproic Acid	254	51	10 74	10 63	10 68	79 9
alpha-Aminocaprylic Acid	250	48	8 63	8 78	8 79	80 8
alpha-Aminoisobutyric Acid	131	37	13 59	13 58	13 58	71 8
Benzidine	300	78	15 36	15 22	15 21	74 0
<i>p</i> Bromoacetanilid	140	39	6 45	6 67	6 54	72 2
3 Bromo-4-acetylaminotoluene	210	41	5 94	5 94	6 14	80 5
<i>p</i> Bromoaniline	120	39	8 05	8 17	8 14	67 5
<i>o</i> -Chloroacetanilid	212	33	8 20	8 19	8 26	84 4
<i>p</i> Chloroacetanilid	208	38	8 42	8 40	8 26	81 7
<i>p</i> -Chloraniline	230	49	10 85	11 04	10 99	78 7
1,4 - Diaminobutanehydrochloride	165	37	17 38	17 32	17 39	77 6
<i>p</i> - Dimethylaminobenzaldehyde	214	79	9 26	9 19	9 39	63 1
<i>o</i> -Tolylurea	329	89	18 44	18 46	18 65	72 9
<i>p</i> -Tolylurea	240	76	18 48	18 46	18 65	68 3
2,4,6 Tribromoaniline	60	31	4 30	4 31	4 25	48 3

A series of compounds, containing nitrogen in the nitro form, were investigated next These compounds were analyzed according to the procedure outlined above The results are presented in Table II From the data included in this table, it may be observed that there was considerable reduction in the clearing time, but there was little agreement in the percentages of nitrogen obtained With these nitro compounds, the digestion was stopped when the liquid had attained a light straw color, and the nitrogen was determined in the usual manner It was thought that prolonged heating after the straw color was obtained might increase materially the percentage of nitrogen found In no case where the heating was continued as long as one hour were quantitative results obtained Quantitative recovery of nitrogen was not only impossible, but check results could not be obtained when two determinations were performed under exactly the same conditions Many investigators have reported that nitro compound cannot be determined successfully by the unmodified Gunning method

TABLE II—DETERMINATION OF NITROGEN IN NITRO COMPOUNDS

	Time in Minutes		Per Cent Nitrogen		Theoretical
	Gunning	Plus H <sub>2</sub> O	Gunning	Plus H <sub>2</sub> O	
<i>o</i> Nitrobenzoic Acid	330	55	8 19	8 23	8 38
	250	30	7 76	7 76	
<i>m</i> Nitrobenzoic Acid	270	40	7 97	7 75	8 38
	238	46	8 28	8 16	
<i>p</i> -Nitrobenzoic Acid	270	50	7 82	8 13	8 38
	250	33	7 71	7 48	
<i>o</i> Nitrophenol	220	60	9 43	7 96	10 07
	170	62	9 17	9 06	
<i>m</i> Nitrophenol	195	75	8 92	9 67	10 07
	160	95	9 01	9 00	
<i>p</i> Nitrophenol	250	52	8 09	7 81	10 07
	170	63	8 22	8 41	
<i>o</i> -Nitrobenzaldehyde	120	42	9 21	7 20	9 27
	120	40	8 31	7 30	
<i>m</i> -Nitrobenzaldehyde	126	30	9 32	8 99	9 27
	118	32	8 42	9 00	
<i>p</i> Nitrobenzaldehyde	125	30	9 33	9 08	9 27
	116	28	9 28	9 07	
1,2,3-Nitrotoluidine	150	50	13 29	13 75	18 41
	180	52	14 91	14 00	
1,3,4 Nitrotoluidine	165	48	12 79	13 02	18 41
	180	53	12 67	13 02	
1,2,4 Nitrotoluidine	165	48	15 44	17 00	18 41
	180	52	17 29	17 27	
1,2 5-Nitrotoluidine	150	52	14 56	15 67	18 41
	180	50	18 02	15 01	
1,4,3 Nitrotoluidine	165	49	11 61	12 87	18 41
	180	51	12 32	14 19	
<i>o</i> Nitrochlorobenzene	140	55	4 29	3 73	8 89
	140	60	5 02	5 02	
<i>m</i> -Nitrochlorobenzene	150	57	3 79	3 09	8 89
	200	55	4 50	3 53	
<i>p</i> -Nitrochlorobenzene	200	51	3 73	3 36	8 89
	150	47	3 41	2 58	

## CONCLUSIONS

1 The percentage nitrogen in compounds containing the nitrogen in form of the amino group is rapidly and accurately determined by use of strong hydrogen peroxide in the Gunning method

2 The addition of hydrogen peroxide does not make possible the determination of nitrogen in organic compounds containing the nitro group

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3rd Edition

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## STRYCHNINE IV LETHAL DOSE STUDIES ON CATTLE AND SHEEP \*

JUSTUS C WARD AND F E GARLOUGH <sup>1</sup>

The earlier papers in this series (1, 2, 3) have presented data on chemical and physiological tests for strychnine, and on masking of strychnine bitterness by certain chemicals. The present discussion deals with the toxicity of strychnine to cattle and sheep.

Literature on the feeding of measured doses of strychnine to domestic animals to determine the lethal doses is very deficient (4). It is because of this fact that the authors are presenting data accumulated under somewhat adverse conditions, since many more animals were involved in their tests than have been reported upon at any one time previously. In these studies 26 cattle and 65 sheep were used.

The obtaining of such a large number of test individuals was made possible through the cooperation of governmental agencies concerned with the administration of the cattle and sheep-buying programs in Idaho and Wyoming during the fall of 1934. The buying program was carried out as a drought relief measure to prevent starvation of a large number of animals on the depleted ranges during the winter. The animals purchased by the Government were graded down to a class that was called "condemned". These "condemned" animals, by the terms of purchase, were to be slaughtered on the owner's property and were to be destroyed. Many of these individuals were organically sound, but were emaciated to the extent that they would not be able to reach a shipping point in condition to be fed back to usable condition. By following the buying crews it was possible for the authors to obtain animals in fairly good condition for their experiments. The tests were always run with the full knowledge and consent of the owner of the "condemned" stock. Normal stock may differ in susceptibility.

Two major observations were made on each animal studied, *first*, the lethal dose, *second*, the rate and manner in which the animal accepted the ground squirrel poison which was the form in which the strychnine was fed. Because of the fact that both cattle and sheep refused the poisoned grain in many cases it was necessary to resort to forced feeding to obtain the lethal dose data needed. Tabulations will show where this forced feeding was used.

The results seem widely variable, so the correlation of dosage trials will prove of value.

Tables I and II indicate that four of eight "condemned" animals died at 15 mg /Kg, two of three animals at 16 mg /Kg and all died at doses of 18 mg /Kg and above. Doses below 12.50 mg /Kg were only occasionally dangerous, as in the case of a markedly susceptible animal, since only one of nine cows in this dosage range died.

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\* Scientific Section A. P. H. A. Portland meeting, 1935.

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TABLE I—STRYCHNINE EFFECTS IN "CONDEMNED" CATTLE

Dose Mg/Kg	Bait	Method of Application	Symptoms	Results
20 00	Bran mash	Forced <sup>1</sup>	Spasms—25 min	Death—40 min
18 00	Grain	Fed	" —42 "	—90
17 80	Bran mash	Forced	—15	—20
17 50	Grain	Fed	Completely refused the bait	— Shot
17 50	"	"	"	"
16 00	Bran mash	Forced	Spasms— 2 hours	Death— 4 hours
16 00	" "	"	—33 min	" —43 min
16 00	" "	"	Stiff—no spasms	Survived 4½ hours, shot
15 00	" "	"	Spasms—30 min	Death—60 min
15 00	Grain	Fed	None	Survived 4 hours, shot
15 00	"	"	Slightly nervous	" 2 " "
15 00	Bran mash	Forced	None	" 9 " "
15 00	" "	"	Spasms—8 min	Death—10 min
15 00	" "	"	" —40 "	" —95
15 00	" "	"	" —35 "	" —80
15 00	"	"	Slightly nervous	Survived
12 50	Grain	Fed	"	Survived 4 hours, shot
12 50	"	"	None	Survived 2½ hours, shot
12 00	Bran mash	Forced	"	Survived 6½ hours, shot
12 00	" "	"	Slight spasm 2½ hours	Survived 6¼ hours, shot
12 00	" "	"	None	"
After 18 hours animal normal Force fed 15 mg /Kg more				Survived both doses
10 00	Grain	Fed	Spasms—32 min	Death—60 min
10 00	"	"	None	Survived 3 hours, shot
10 00	Bran mash	Forced	None	Survived 3 hours, shot
8 00	"	"	"	Survived 2½ hours, shot
5 00	"	"	"	Survived 3 hours, shot

<sup>1</sup> These animals refused to eat the poisoned grain offered, so they were force fed the bran mash

<sup>2</sup> This animal was highly nervous and excitable

TABLE II—CORRELATION OF STRYCHNINE EFFECTS IN "CONDEMNED" CATTLE

Dose Mg /Kg	Results
20 00	One animal fed this dose died in 40 min 1/1 (40 min)
18 00	" " " " " 90 1/1 (90 " )
17 80	" " " " " 20 " 1/1 (20 " )
17 50	Two animals " " " refused to eat 0/ (—, —)
16 00	Two of three animals fed this dose died in 42 min and 4 hours respectively One survived 2/3 (42 min , 4 hours)
15 00	Four of eight fed died in 60, 10 95 and 80 min 1/3 (60 10, 96, 80 min )
12 50	Two of two animals survived 0/2 (—, —)
12 00	" " " " " 0/ (—, —)
10 00	One of three died in 60 min 1/3 (60, —, —)
8 00	One animal survived
5 00	" " "

To determine what these figures would mean in terms of a ground squirrel poison containing 1 ounce of strychnine to each 10 quarts of steam-rolled oats—the strongest formula generally used in the areas where these animals were tested—the following computations are made Assuming 15 mg /Kg as a possible killing dose (LD<sub>50</sub>), 1/10 of a grain of strychnine per pound of cow would be needed This means 1 23 Gm or 80 grains, for the average 800-pound "condemned" adult cow

In the "1 to 10" ground squirrel poison, these 80 grains would be carried on 1 pound 15 ounces of the steam-rolled bait. Recalling how difficult it was to find even a "condemned" animal that would eat half this quantity of such bait, one can safely conclude that properly distributed ground squirrel poison carries no hazard to cattle. Furthermore, in heavy ground squirrel infestation this 1 pound 15 ounces of poison would be distributed over approximately 4 acres of cattle range. To obtain a possible killing dose, it would, therefore, be necessary for the "condemned" cow to eat every bait on the entire 4 acres, which is inconceivable.

Correlations of data following normal feeding of sheep (Table III) are somewhat badly spotted owing to very slow acceptance of the poison and to the necessity of killing the animals after a maximum of three hours in order that the skinning crew could maintain its schedule. This series does not indicate, however, that 12.50 mg /Kg would be the dangerous dose for the average animal.

TABLE III—STRYCHNINE EFFECTS IN "CONDEMNED" SHEEP

## (a) Normal feeding—salt baited—but not forced

Dose Mg /Kg	Method of Application	Symptoms	Results
25 00	Fed	Spasms—89 min	Death 2 hours
24 20		Nervous—3 hours	Killed for crew 3 hours
24 30		Spasms—61 min	Death 96 min
18 40		Spasms—86	Death 96 "
17 10		Nervous—3 hours	Killed for crew 3 hours
14 70		Spasms—84 min (up)	' 3 "
12 50		Spasms	Death 60 min
12 50		None	Killed for crew 3 hours
10 10 and 10 00			3
6 80 and 6 80			" 3 "
6 40	"	Spasms—32 min	Death 58 min
5 00 and 4 10		None	Killed for crew 3 hours

## (b) Forced feeding

Dose	No Animals per Dose	Symptoms	Results
40 00	2	Spasms 34 13 min	Death 52 18 min
35 00	1	25	44
30 00	2	17 11 '	27, 19
28 00	1	17	25
27 50	2	25 170	40 200
25 00	3	15 21 54	26 30, 74
22 50	2	33 30	41, 35
20 00	3	49 21 —	56 53 over night
17 50	3	33 — —	58 ON, killed
15 00	3	81 105 —	109 110,
12 50	10	64 36 76 — —	74 57, 129 6 hours
		— — — —, —	ON ON ON ON
10 00	10	' 2 1/2 hours —,	ON ON ON ON, ON,
		— — — —,	—, — — — —
		— — — —	
7 50	2	None	Survived

Forced feeding data indicate that 10 mg /Kg ( $1/14$  grain per pound) would be a dangerous dose for "condemned" sheep. Approximately 6 grains (360 mg) of

strychnine might kill an 80-pound sheep. From these figures it appears that slightly more than 3 ounces of a 1 to 10 formula might kill a sheep. These 3 ounces of poisoned grain would be exposed on approximately 1 acre of ground squirrel-infested sheep range. It is inconceivable that a sheep might get all the poisoned grain from an acre, even if feed on the pasturage was extremely short.

To test whether or not the amount of strychnine in the mixture would alter the animals' acceptance, a 1 to 16 bait prepared with a large amount of free salt in it was offered to six additional "condemned" sheep. They were allowed to eat all they would, then the balance was weighed back and the dose taken was computed.

#### ACCEPTANCE TEST 1 TO 16 POISONED GRAIN-FED SHEEP

Dose Eaten Mg /Kg	1 to 16 Bait Ounces	Result
4 85	2	No symptoms in 3 hours
7 00	2 <sup>3</sup> / <sub>4</sub>	No symptoms in 3 hours
6 70	2 <sup>3</sup> / <sub>4</sub>	Very nervous Killed after 1 <sup>1</sup> / <sub>4</sub> hours
10 95	4 <sup>1</sup> / <sub>2</sub>	Slightly nervous Killed after 1 <sup>1</sup> / <sub>4</sub> hours
12 40	6 <sup>1</sup> / <sub>4</sub>	Stiff Killed over night
18 50	7 <sup>3</sup> / <sub>4</sub>	Spasm 68 min Dead 85 min

From this record it would appear that where the grain is available in a formula carrying a high percentage of salt there is a higher palatability factor. For that reason care should be exercised with somewhat greater diligence when salty formulas are used on sheep ranges, particularly during these periods of the year when the grass is short and the animals are cropping very closely.

#### CONCLUSIONS

1 Strychnine in the form of a 1 to 10 ground squirrel poison is not readily taken by either cattle or sheep.

2 There would be needed 1 pound 15 ounces of this 1 to 10 formula to carry a lethal dose for an 800-pound "condemned" cow, and slightly more than 3 ounces for an 80-pound "condemned" sheep.

3 The susceptibility of normal (healthy) animals might differ from that of "condemned" animals.

4 Because of the slowness with which these animals accepted ground squirrel poison voluntarily, many of the tests reported were based on force-feeding methods. This system of administration excited the animals and tended to lower the lethal dose.

5 Because of the small bait spots used in ground squirrel control operations, to get a possible killing dose, a cow would have to pick up *all* the scattered grain from about 4 acres, and a sheep from 1 acre of range.

6 Properly exposed ground squirrel poison offers no hazard to cattle and only a slight hazard to sheep.

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## EPHEDRINE SYNTHESIS I THE PREPARATION OF PROPIOPHENONE DIETHYL ACETAL AND OF 1-PHENYL-1-ETHOXY-PROPENE-1<sup>1</sup>

BY ERNEST L BEALS WITH F A GILFILLAN<sup>2</sup>

Ephedrine, the chief alkaloid in the Chinese drug Ma Huang, was discovered by Nagai (1) in 1887 Its constitution was shown by Spath and Gohring (2) to be represented by the formula  $C_6H_5 \cdot CHOH \cdot CH(NHCH_3) \cdot CH_3$  Since this contains two asymmetric carbon atoms, four optically active forms may exist, together with racemic or other mixtures of these four The two active forms in which the hydroxyl and methylamino groups are adjacent were believed to represent *l*- and *d*-ephedrine the two in which these groups are on opposite sides of the axis, to represent *l*- and *d*-pseudoephedrine (3)

Both ephedrine and pseudoephedrine have been synthesized by various procedures, but the exact relationship existing between them seems still a matter of some doubt (4) The present investigation is an attempt to throw additional light upon this question

### EXPERIMENTAL

*Propiophenone Diethyl Acetal*—The method employed follows that of Claisen (5) in which one mole of ketone in 3 moles of alcohol is treated with 1.1 mole of ethyl orthoformate in the presence of a catalyst (6, 7) Into an Ehrlenmeyer flask were put 72 Gm of propiophenone 88 Gm of ethyl orthoformate 84 Gm of absolute alcohol and 0.3 cc of 36% hydrochloric acid The temperature increased about ten degrees and after several hours there developed a beautiful cerise color which gradually faded into yellow At the end of 24 hours the product was neutralized with alcoholic KOH and the ethyl formate alcohol and excess orthoformic ester were removed by distillation The acetal was fractionated under reduced pressure with yields, in successive operations of 97.9%, 96.2%, 96.5% and 97.6% of the theoretical

The product was a colorless mobile liquid with a faint aromatic odor A cryoscopic determination of the molecular weight in benzene showed 207.45 (Calculated for  $C_6H_5 \cdot C(OC_2H_5)_2$ ,  $C_8H_{10}$  was 208.2) Its boiling point under varying pressure was (6 mm = 93-96°), (8 mm = 99-100°) (10 mm = 100-101°) (14 mm = 108-110°) (23 mm = 119°) and (760 mm = 226-228°) When boiled at atmospheric pressure there was a slight decomposition into the monoethyl derivative The refractive index was  $d_{25} = 1.4767$  The specific gravity  $25^\circ/4^\circ$  was 0.94476

*1-Phenyl-1-Ethoxy-Propene-1*—When propiophenone diethyl acetal was boiled for some time under atmospheric pressure, it was partially decomposed into the monoethyl derivative and ethyl alcohol In order to carry this decomposition to completion, some agent must be introduced as an alcohol acceptor (8) Acetyl chloride serves very well in this capacity, but since one by-product resulting is hydrochloric acid, which would effect complete hydrolysis of the acetal, this must be neutralized as formed Pyridine functions admirably for this purpose

<sup>1</sup> Reconstructed from a thesis by Ernest L. Beals presented in partial fulfillment of the requirements for the degree of Master of Science at the Oregon State College

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To a mixture of 25 Gm of propiophenone diethyl acetal with 10 Gm of pyridine, 10 Gm of acetyl chloride was slowly added with stirring the mixture being chilled with ice and salt. The odor of pyridine disappeared the contents of the flask becoming a pasty white mass. After standing fifteen minutes, a slight excess of pyridine was added, and the reaction was allowed to stand over night. Ether was then added and the flask contents were filtered, washing the precipitated pyridine hydrochloride with ether. The filtrate was distilled, removing in order the ether ethyl acetate and pyridine. The liquid remaining in the flask was distilled under reduced pressure, practically all passing over at  $105^{\circ}$  under 19 mm pressure. The yields on two successive runs were 83.6% and 92.8% of the theoretical.

The product was a colorless aromatic liquid, immiscible with water, and readily hydrolyzed by acids, yielding the original ketone. It developed a pale yellow color when boiled for some time at atmospheric pressure. It instantly decolorized a solution of bromine in carbon tetrachloride. A determination of its molecular weight by the freezing-point method in benzene gave a value of 161 (Calculated for  $C_6H_5C(O C_2H_5)CH_2CH_3$  was 162). The boiling point under varying pressure was (12 mm =  $95-96^{\circ}$ ), (16 mm =  $100-101^{\circ}$ ), (19 mm =  $105^{\circ}$ ) and (760 mm =  $220-221^{\circ}$  corr). At  $25^{\circ}$  the refractive index lay between 1.5207 and 1.5210, and the specific gravity at  $25^{\circ}/4^{\circ}$  was 0.95441.

In attempting to convert this compound into racemic ephedrine, some difficulties were encountered which have not as yet been overcome, but the investigation is to be continued.

#### SUMMARY

1 In attempting to synthesize ephedrine by a new method, a new compound was produced, propiophenone diethyl acetal, the physical constants of which were determined.

2 This acetal was converted into an unsaturated compound, also new in the literature, 1-phenyl-1-ethoxy-propene-1, the physical constants of which were also ascertained.

3 Work will be continued on converting this unsaturated compound into ephedrine.

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#### SCHEELE SESQUICENTENNIAL

German apothecaries held a Scheele memorial meeting in coöperation with the Society for the History of Pharmacy, in Stralsund, May 17th. Carl Wilhelm Scheele was born in Stralsund, December 1742; he died in Koping, May 1786. Swedish apothecaries participated in the memorial meeting, the addresses of the occasion included one on Scheele—the man, and another as the scientist. Scheele was employed for a number of years in the Apotek which he acquired in 1776 and here he died ten years later. Observation, experimentation and sacrificing devotion gained for him surpassing eminence.

## CORRECTABLE PHARMACEUTICAL AND CHEMICAL INCOMPATIBILITIES \*

BY GEORGE L. SECORD

The problem which gives the prescription pharmacist the greatest concern and the subject which enters into all branches of pharmaceutical learning, is *Incompatibility* involving more particularly the pharmaceutical and chemical types. The degree of permissible deviation from the prescription proper, is a matter of considerable controversy with many pharmacists, due largely to an inferiority complex, a lack of sufficient therapeutic knowledge or an unwarranted fear that any modification of the prescription would either change it medicinally or that such a change would meet with disfavor on the part of the physician.

No calling of any consequence was ever practiced by "rule of thumb." Both pharmacy and medicine are extremely broad in their application, and just as the physician's selections of remedies must be varied with the patient's needs, so the pharmacist must adjust his training to the peculiarities of the prescription.

Obviously, no agent should be used which increases the danger, changes the appearance, permanency, uniformity of dose or intended effectiveness which would in any manner, or in any material degree, alter the medicinal effect from that originally intended by the physician. *Correctives* then, in this sense, should be employed in the minimum quantities and only those *Changes* resorted to under this order of things which would be important therapeutically and acceptable to the physician, realizing that in every case the finished product must represent the original intent of the physician in its fullest measure. This thought is always an element of the greatest importance.

It is a matter of record that opinions of pharmacists are sought more and more by the members of the medical profession. Experience teaches them to respect the training and ability of the men who carry on the ethical practices of our profession. Confidence and recognition for the pharmaceutical profession must be established, if pharmacists are to fulfil in the greatest measure the type of service that is expected of them—in the face of certain interests that have unfortunately swept the country, and who by their persistency have crushed out a large part of pharmacy's rightful practice and flooded the country with high-priced specialties. Notwithstanding this vigorous campaign, the courage of pharmacists is demonstrated by progress and the study of incompatibilities presents a phase of pharmaceutical and medical research.

It is of fundamental importance that pharmacists strive for professional recognition and advancement.

The incompatibilities presented are studies of some of the more common problems which frequently confront the pharmacist. It is not intended that these prescriptions with the accompanying remarks convey anything particularly unusual to the prescription pharmacist, but they have proved satisfactory over a long period of years.

### PHARMACEUTICAL AND CHEMICAL INCOMPATIBILITIES

Rx 1	Acetylsalicylic Acid	10
	Potassium Citrate	10
	Syrup	} of each
	Water q s	
		60

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\* Section on Practical Pharmacy and Dispensing, A. Ph. A., Portland meeting, 1935

This is a typical example of the every-day prescription in a drug store when for the purpose of convenience the physician desires to present the medication in liquid form

Acetyl Salicylic Acid being only partially soluble in this proportion, even in the presence of the potassium citrate, which contributes to its solubility, separates from the main body of the liquid and is partially deposited and suspended on the surface. The rapidity with which this separation takes place does not permit of a uniform dose even when the mixture is thoroughly shaken and, therefore, it becomes necessary to add an agent of suspension for the purpose of increasing the viscosity and thereby preventing the easy separation of this insoluble material. The substance best adapted to this prescription is tragacanth, 5 grains will accomplish the object desired, holding the insoluble Acetyl Salicylic Acid in a highly uniform degree of suspension until a dose can be poured

℞ 2	Fluidextract of Iris	5
	Aromatic Elixir <i>q s</i>	60

This prescription clearly demonstrates a type of pharmaceutical incompatibility resulting from a change in menstrua. The resinous character of iris requires approximately 80% of alcohol. This is also true for drugs like buchu. When galenical preparations of this kind are brought in contact with vehicles such as Elixir of Pepsin Compound and Aromatic Elixir which are relatively low in alcoholic content a lowering of alcoholic percentage takes place with resulting precipitation. The correction is by addition of sufficient alcohol to prevent this precipitation. When two or more galenicals are present, one with a high alcohol content and another with a relatively low content, obviously, there cannot result a thoroughly clear liquid since an intermediate alcohol content must prevail, that is, an average between that of each of the preparations present. The correction was made with 4 drachms of alcohol

℞ 3	Bismuth Subnitrate	8
	Phenyl Salicylate	4
	Syrup } of each <i>q s</i>	60
	Water }	

This prescription carries two insoluble substances—bismuth subnitrate and phenyl salicylate. While bismuth subnitrate is an impalpable powder, phenyl salicylate is a crystalline body requiring careful treatment in a mixture of this kind. The *modus operandi* is to reduce the phenyl salicylate to a fine powder in a mortar and mix thoroughly with the bismuth subnitrate. To this the syrup is added gradually and finally the water. Heat should never be employed in a preparation of this kind, since it fuses the phenyl salicylate and permits it to recrystallize in the mixture.

Both bismuth subnitrate and phenyl salicylate separate rapidly from this mixture and as a consequence must receive proper attention. The correction is made with 5 grains of tragacanth which is mixed intimately with the powders before the addition of the Syrup. Its presence increases the viscosity of the preparation preventing the ready separation of the insoluble bodies.

℞ 4	Citrated Caffeine	0 03
	Acetyl Salicylic Acid	4 0
	Phenacetine	2 0
	Elixir Pepsin Compound <i>q s</i>	60 0

This prescription presents another type requiring a suspension agent. Here again tragacanth is the preferred substance; however, owing to the alcoholic content of the Elixir of Pepsin Compound, 7 grains of tragacanth are required to accomplish the object desired.

℞ 5	Adrenalin Chloride Sol	4 0
	Menthol } of each	0 03
	Camphor }	
	Olive Oil <i>q s</i>	30 0

Owing to the aqueous nature of solution of adrenalin chloride, it is immiscible with the menthol, camphor, olive oil. Correction is made by obtaining permission from the physician to use the practical equivalent in an oil solution, namely, adrenalin inhalant, ℞ 6. The same prin-

ciple is portrayed in prescription 6, wherein through ignorance of solubility the physician has prescribed ephedrine sulphate in place of ephedrine alkaloid

℞ 6	Ephedrine Sulphate	0 30
	Menthol	
	Camphor	
	Olive Oil	
	Liquid Petrolatum	
	} of each	
	} of each <i>q s</i>	
		0 015
		30 0

The correction is in obtaining the permission of the physician to substitute ephedrine alkaloid in an equal amount for the ephedrine sulphate thus providing for a relatively clear preparation

℞ 7	Spirit Nitrous Ether	15 0
	Potassium Citrate	30 0
	Water <i>q s</i>	60 0

Potassium citrate is very soluble in water and nearly insoluble in alcohol. When a nearly saturated solution in water is prepared, as in this instance, this solution becomes immiscible with the Spirit of Nitrous Ether, which is alcoholic, and the two substances are noticeably separated and mix with difficulty. The speed with which the separation takes place prevents the giving of a uniform dose. The correction is in the dilution of the prescription to twice its quantity with water and doubling the dose. Potassium citrate is not thrown out of solution for the reason that the affinity of the water for this substance is greater than for the alcohol.

℞ 8	Solution Aluminum Acetate	12
	Hydrous Wool Fat	5
	Petrolatum <i>q s</i>	30

In the foregoing an ointment is wanted and the physician expects, owing to the properties claimed for wool fat, that the 12 cc. of solution of aluminum acetate will be picked up with the 5 Gm. of wool fat. This is erroneous since the hydrous wool fat will not take care of that quantity of fluid. The correction is in substituting 5 Gm. of Aquafor for an equal weight of petrolatum.

℞ 9	Zinc Sulphate	0 03
	Water	2 0
	Sol. Adrenalin Chloride	3 0
	Petrolatum, white	

This prescription is intended for an eye ointment. The 3 mg. of zinc sulphate are dissolved in water, solution of adrenalin chloride added and this added to 25 Gm. of white petrolatum. The ointment as prepared would appear to be free from criticism, but upon standing a short time separates water, due to the immiscibility of this quantity of aqueous material with Petrolatum.

The correction is in substituting 5 Gm. of Aquafor for an equal weight of white petrolatum.

℞ 10	Fluidextract Buchu	10
	Aromatic Elixir	50

Opportunity is taken to show the application of the Elixir Iso Alcoholic advocated by Dr. Bernard Fantus of the University of Illinois College of Medicine. Fluidextract of Buchu is shown with aromatic elixir resulting in the profuse separation of the resinous constituents of the drug.

Buchu is also shown with Elixir Iso Alcoholic which results in a beautifully clear liquid. Elixir Iso Alcoholic means of the same strength. In other words Fluidextract of Buchu has an alcoholic strength of 80%. To be essentially miscible with it, Elixir Iso-Alcoholic should be of the same strength. In making this Elixir an elixir of low alcoholic content is employed, 5% and a high one of 90%. These two preparations are used in various proportions to obtain an alcoholic preparation of the desired strength.

℞ 11	Spirit Nitrous Ether	8 0
	Potassium Iodide	2 5
	Syrup	
	Water <i>q s</i>	30 0

Most specimens of Spirit of Nitrous Ether present an acid reaction due either to errors in manufacture or the breaking down of ethyl nitrite through long standing. It is a well known fact that nitrous acid is incompatible with iodides, and since Spirit of Nitrous Ether is a solution of ethyl nitrite, a reaction naturally follows with liberation of iodine turning the prescription a bright red.

The correction is in neutralizing the free acid in the spirit of nitrous ether before adding it to the other ingredients, preferably with some agent like potassium bicarbonate. Prescriptions thus prepared have kept for several years without liberation of iodine.

R̄ 12	Potassium Iodide	5 0
	Sodium Nitrite	2 0
	Syrup of Squill	15 0
	Water q s	120 0

This prescription presents the same type of incompatibility as No. 11 in a little different way. Sodium nitrite is used in the presence of potassium iodide and syrup of squill which is acid. Acetic acid breaks down the sodium nitrite forming nitrous acid which is incompatible with potassium iodide, liberating free iodine.

The correction is in obtaining the physician's permission to use an equivalent amount of another preparation of squill which is free from acid, preferably an equivalent amount therapeutically of the fluidextract which is free from acid.

R̄ 13	Compound Solution Iodine	10
	Elvir Iron Quinine and Strychnine N F q s	120

This prescription presents another chemical incompatibility resulting in the precipitation of the alkaloids of quinine and strychnine.

The correction is in raising the alcoholic content of the preparation to a point where the quantities of these substances present will be soluble. This is accomplished with 8 cc. of alcohol substituted for an equivalent amount of the Elvir of Iron Quinine and Strychnine before the addition of the Lugol's Solution.

R̄ 14	Codeine Sulphate	0 6
	Potassium Bromide	40 0
	Syrup	
	Water of each q s	120 0

The codeine previously dissolved in a part of the water is added to a solution of potassium bromide in the balance of syrup and water with the almost immediate formation of a white precipitation of codeine alkaloid. The corrective measure is to replace 10 cc. of the water with alcohol and add the solution of codeine sulphate to this mixture. The alcohol acts dissolving upon the codeine alkaloid and prevents its precipitation. A prescription of this kind as corrected is acceptable to the physician and safe for use by the patient.

R̄ 15	Strychnine Sulphate	0 020
	Potassium Iodide	5 0
	Syrup	15 0
	Water q s	120 0

To strengthen the reaction 10 times this quantity of strychnine was used.

This presents the same problem as given in the preceding prescription, but owing to the small dose of strychnine it is somewhat more treacherous. Strychnine is deposited as a white crystal and as such is difficult to detect. The corrective measure is as before, namely, alcohol in sufficient amount, approximately 6 cc., which acts dissolvingly upon the alkaloid keeping it safely in solution. For purposes of exhibit the quantity of strychnine is increased 10 times.

R̄ 16	Tincture Digitalis	10 0
	Morphine Sulphate	0 5
	Liquor Potassium Arsenite	12 0
	Peppermint Water q s	120 0

The incompatibles are morphine sulphate and the potassium arsenite solution which is decidedly alkaline. Since there is insufficient alcohol present to keep the precipitated morphine in solution more alcohol must be added, 12 cc are necessary.

R̄ 17	Soluble Ferric Phosphate	12 0
	Acid Phosphoric	8 0
	Strychnine Sulphate	0 030
	Elix Aromatic	
	Cinnamon Water of each q s	120 0

Sodium citrate in ferric phosphate is the substance which makes ferric phosphate soluble. In the presence of phosphoric acid, the sodium citrate is converted into sodium phosphate resulting in the precipitation of ferric phosphate. To prevent the precipitation it is necessary to add 3 drachms of sodium citrate to the three drachms of ferric phosphate solution or use 10% solution of meta phosphoric acid in a mortar and dissolve—add the remainder of water and finally the phosphoric acid—a clear solution results.

R̄ 18	Betanaphthol	0 60
	Balsam Peru	8 0
	Acid Salicylic	2 0
	Olive Oil	45 0
	Lime Water q s	120 0

Since both an acid and alkali are present some trouble should be expected. When the lime water is added to the olive oil a small amount of calcium oleate is formed which in turn emulsifies the balance of the olive oil. To this mixture, the betanaphthol dissolved in a small amount of alcohol is added then the Balsam of Peru, warmed and added very gradually under shaking or mixing in a mortar and lastly, the salicylic acid also dissolved in a small amount of alcohol. As soon as the salicylic acid is added, calcium salicylate is formed which releases the calcium from the calcium oleate thus destroying the insoluble soap which in turn removes the agent of emulsification and the preparation becomes an unsightly mixture.

To correct it is necessary to consult the physician and obtain his permission to eliminate either the salicylic acid or the lime water. If the lime water is eliminated an ordinary emulsion with acacia can be easily prepared resulting in the same type of mixture. The Balsam of Peru is somewhat troublesome, but can be properly handled through careful emulsification in the mixture.

R̄ 19	Crude Coal Tar	6 0
	Solution Aluminum Subacetate	12 0
	Petrolatum q s	60 0

Crude coal tar and solution of aluminum subacetate are not thoroughly picked up by the petrolatum. The crude coal tar remains stringy and the solution of aluminum subacetate separates in drops.

To correct it is necessary to substitute 10 drachms of Aquafor for an equal amount of petrolatum when a smooth and homogeneous ointment is produced.

R̄ 20	Mercurochrome	1
	Water	10
	Petrolatum	20

The physician has intended the petrolatum to pick up the water, necessary for solution of Mercurochrome. This, however is not accomplished. The pharmacist has one of two suggestions to offer to the physician.

- 1 To substitute a part (10 Gm) of the petrolatum with wool fat
- 2 To substitute 5 Gm of petrolatum with an equal weight of Aquafor

Owing to the simplicity of handling the latter method is shown here in the exhibit—(at the meeting)

## PHARMACY IN MISSISSIPPI \*

BY LEW WALLACE <sup>1</sup>

It has been a pleasure to look back through the years and study the thoughts of the men who have helped to shape the destiny of our profession in this state since the earliest days. The idea of making the practice of pharmacy a privilege under the law was conceived, and to this end the first meeting of the Mississippi State Pharmaceutical Association was held in the Senate chamber at the capital, June 12, 1883.

A number of pharmacists from all sections of the state met in response to the following call:

*"Mississippi State Pharmaceutical Association*—The time seeming propitious and the state of our profession demanding it, we, the undersigned druggists of the state of Mississippi, deem it proper to call for a convention to be held at Jackson, June 12, 1883, for the purpose of organizing a State Pharmaceutical Association. The object of the association will be to unite its members in the bonds of fellowship and common interest, that they may coöperate in elevating the profession, as well as protecting it from the many evils which now affect our trade. We sincerely trust that this effort will receive the hearty and generous support of every druggist in the state, feeling assured that it will prove a great benefit to all. The time and place designated for this convention was selected in view of the fact that June is usually a dull month in trade, and Jackson is the most central, as well as the most accessible point in the state." This meeting was attended by about 30 pharmacists.

These men, feeling that organization, unity of action and comparison of ideas were essential to the advancement of any cause, and believing that there was room for the elevation and extension of pharmaceutical knowledge among the druggists of the state, that there existed a necessity for some supervision of the dispensing of drugs and medicine, both for their own and the general welfare, and that such results could best be accomplished by a State Pharmaceutical Association, passed a resolution as follows:

*Resolved*, That we, druggists and apothecaries from different parts of the state, who are now assembled in convention in the city of Jackson, do hereby organize ourselves into a permanent association for the purpose of accomplishing such results, and that we adopt a constitution and by-laws.

Thereupon, according to the record, a constitution and by-laws was adopted. To this day the wisdom and forethought of those men are very much in evidence in the present constitution and by-laws of the Mississippi State Pharmaceutical Association.

We find that the pioneers in pharmacy of this state in the initial meeting of our Association expressed themselves as having for their aim the uniting of the reputable pharmacists of Mississippi for mutual protection, assistance, encouragement and improvement. To encourage scientific research, to develop pharmaceutical talent, to elevate the standards of our professional thought and, ultimately, to restrict the practice of pharmacy to properly qualified druggists and apothecaries.

Our first pharmacy legislation was enacted into law in 1892, and some time later an additional law was enacted, creating the Board of Pharmaceutical Examiners. In 1921 our law requiring college graduation from a recognized college of

\* Section on Education and Legislation, A. P. H. A., Portland meeting, 1935.

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pharmacy was made a part of the Mississippi Code, and since that day, pharmacy has looked upward and to better things in Mississippi

The passage of the prerequisite requirements was not an act of chance, and a résumé of the advancement of pharmacy in Mississippi would be sadly lacking, if it failed to touch even sparingly the life and work of at least a few of the noble men who have stood by our profession through the years

Early after the beginning of the twentieth century, a young man with a vision fought long and hard for pharmacy, and about 1908, succeeded in having established at the University of Mississippi a department of pharmacy This man, who was none other than our present well-loved Henry Minor Faser, was unanimously elected dean of the School of Pharmacy and was the first to open its doors to the youth of Mississippi The School of Pharmacy was housed in a small part of the basement of one of the oldest buildings at Oxford But in the few short years between 1908 and 1921, the energetic leadership of Dr Faser, as he is affectionately known to hundreds of Mississippi pharmacists, carried his department from its humble beginning in the basement of an old building to an outstanding place among the façades of the campus Due to Dr Faser's untiring efforts, there was erected in a prominent part of the campus circle a \$350,000 00 pharmacy building, with all modern equipment and conveniences It was a sad day for Mississippi pharmacy when Dr Faser, some eight years ago, resigned as dean of the School of Pharmacy But through every dark cloud there is a silver lining, and we found our ray of hope that his place could be filled when the State of Mississippi secured as the dean of our School of Pharmacy, Elmer L Hammond, a man in whom we are justly proud and a man who has adequately and fittingly upheld the traditions of the School of Pharmacy at "Ole Miss" Dean Hammond has won a place in the hearts of Mississippi pharmacists and has had a very important part in shaping our activities

The Legislative Committee added very little to our pharmacy laws from 1921 to 1934 However, the members of our Association were active during these years and did many things to improve conditions Outstanding during this time was the proposal of President Charles E Wilson, of the Association, about four or five years ago, when his plan of a paid business manager was adopted at Vicksburg and unanimously supported by the druggists of Mississippi Claude E Anding of Flora, Mississippi, was elected as our first paid business manager Mr Anding did wonderful work throughout Mississippi for the cause But after a time the program was discontinued because it was found impossible to put through our measure due to the fact that our efforts were directed against issues controllable only by legal procedure, and Mr Anding and the members of our official family had nothing more than the backing of a voluntary organization Such men as S B Key, present secretary of the Mississippi Pharmaceutical Association, Fred W Duckworth, prominent and valuable member of our organization, H B McInnis, Lumberton, Chester F Jones, Jackson, G W Harrison, Forest, P K Thomas, Tupelo, B W Johnson and J L Hicks, Laurel, Mississippi, W J Cox, Batesville, Sam McDuffey, Nettleton, and Charles E Wilson, director of our U S P and N F Program, along with many others, were outstanding during these years for the betterment of conditions in Mississippi pharmacy To their untiring efforts and suggestions is due the credit for the launching of our present program that is backed by the mandate of organized society and has for its objective the creation of a strong

and determined desire in the minds of the pharmacists in this state to stand by their profession in order that the public will stand by them

On March 9, 1934, there was enacted into law that part of chapter 338 of the Mississippi Code known as House Bill No 155 This legislation, designed to throw a protective band around the profession of pharmacy, includes everything in the way of drugs and medicine other than patent, proprietary and household remedies Our Legislative Committee, guided by the experience of pharmacists in other states and ably assisted by T O Slaughter, Waynesboro, saw fit to exempt these medicines, feeling that there was little need for legislation to cover their sale and distribution The Legislative Committee, with reference to this controversial subject, felt that regulation should begin with the manufacture and end with the pharmacist

Pharmacy in Mississippi to-day has more than one leg upon which to stand, and we are at this time engaged in the multiple task of strengthening these legs to put our profession in the high position it deserves We are advocating—and there is every indication that we shall carry to a successful conclusion—the formation of what we are pleased to call a Southeastern Drug Club composed of several southern states to band together for mutual protection At the convention of last June we adopted a program of U S P and N F extension similar to other U S P and N F plans, and Charles E Wilson, Corinth, Mississippi, was unanimously elected as the Director of this division of our program We have an active paid committee whose duty it is to seek ways and means of cooperating with each division of organized activity within this state for the purpose of exchanging suggestions and to establish a spirit of cooperation

We are face to face with our problems and realize that we have a tremendous task in front of us, but when we think back over the record of the AMERICAN PHARMACEUTICAL ASSOCIATION and other organizations that have so long championed the cause of pharmacy, we are encouraged by a knowledge of their achievements and are determined to carry on

The pharmacists of Mississippi are proud of their national organization, the AMERICAN PHARMACEUTICAL ASSOCIATION, and have a deep and sincere interest in the success of its undertakings

NOTE Mississippi now has an A Ph A Student Branch—See April JOURNAL, page 366

#### PASTEUR'S TREATMENT OF HYDROPHOBIA \*

'Once more M. Pasteur has startled the civilized world with the prospect of a great discovery in medical science He believes and many of the greatest medical authorities believe with him, that he has perfected a method of treatment of hydrophobia which shall be not only prophylactic but, what is of far greater importance, curative also He has for a long time occupied himself with experiments with the virus of this dreadful disease He has kept a number of mad dogs, has obtained the poison from their saliva, and has moderated it to a safe dilution by successive inoculations on rabbits, he has 'vaccinated' dogs with this modified virus and he has proved that under the influence of the vaccination they are not, to all appearance, liable to infection Of late he has had the opportunity of testing his solution of the virus on human beings The discovery is still on its trial but there can be no doubt of the great hope which may reasonably be entertained that this most terrible of diseases may not only be cured but extirpated "

\* Retrospect of fifty years ago—from *Chemist and Druggist*

## EARLY DRUG STORES IN OKLAHOMA \*

BY LOYD E. HARRIS <sup>1</sup>

When was the first drug store established in Oklahoma? That question has not been answered. Oklahoma was settled in relatively small sections at a time and has been under the flags of a number of governments at various periods. It is not the purpose of this paper to review the history of the state, but some facts will be of interest.

Coronado, in 1540, together with thirty horsemen traveled through Oklahoma into Kansas and then returned through the panhandle to Texas. To the east, De Soto had sailed from Cuba and explored Alabama, Mississippi, Arkansas and possibly Missouri and eastern Kansas. This gave the Spanish claim to all of what is now Oklahoma (1).

The French came to this territory after Sieur de Bienville founded New Orleans in 1718. From that point, traders came into eastern Oklahoma and some probably went up Red River and across the plains of the western part of the state (2).

Oklahoma became a part of the United States as the result of the Louisiana Purchase, April 30, 1803 (3). Soon after this date President Jefferson sent several exploring parties into the acquired lands and some of them visited Oklahoma. Z. M. Pike and James B. Wilkinson, twenty-three soldiers and some Osage and Pawnee Indian chiefs, who had been to see the President, started from New Orleans in July 1804. They traveled to the Arkansas River where Wilkinson became ill. He and five men started back home, crossing that part of Oklahoma along the river (4).

Thomas Nuttall, the botanist, visited Oklahoma in 1819 with a party of soldiers who had been sent to remove some white families that had settled in what is now Choctaw County. He reported finding, in addition to the many plants, a salt works. This was on a trip up the Arkansas River to Glenn's trading house, near the mouth of the Verdigris River (5). Jacob Fowler described Bean's salt works, located on the Illinois River in 1821. The salt was obtained by evaporating the water from a salt well in huge kettles (6).

Fort Gibson was established in Oklahoma in 1824. Washington Irving visited there in 1832 and traveled through central Oklahoma with the rangers, his experiences are described in his "A Tour of the Prairies."

The Cherokee Indians, living in Georgia, made a treaty in 1817 to move west to Arkansas, between the Arkansas River and White River. They agreed to move on further west, in 1828, to seven million acres of land in Oklahoma. Many of them did not leave Georgia until 1838 when they were rounded up and brought to the Oklahoma lands. This is one of the forced removals of the Indians that is well known for the many hardships (7).

Practically all of Oklahoma had been explored by 1835, but there were few towns. The first mission was established in 1820, but records of the first drug store are missing.

Tahlequah was established as the Capital of the Cherokee Nation in 1839 (8). Walter Evans, who had married a Cherokee, opened a drug store there in 1870.

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The store was sold to a man by the name of Pendleton, who disposed of it to Poke Carter in 1888. Both of the latter had Cherokee wives. The store has been in the same location since its opening and in the same building since 1887. A Mr. Crew bought a part interest in it in 1896 and his brother bought the other from Carter six years later. They installed walnut fixtures in 1890, bringing them from Georgia to Fort Smith, Arkansas, by train and then by wagon to Tahlequah. The store is still owned by the Crews (9).

Early General Merchandise stores had drug departments. This is evidenced by an advertisement appearing in *The Cherokee Advocate*, a newspaper published in Tahlequah. The one in the issue of July 28, 1880, read, in part, as follows: "J. Thompson, Dealer in General Merchandise, Tahlequah, C. N.—A Full Stock of Drugs Always Kept on Hand." The first advertisement of a drug store in Tahlequah was found in this same paper in 1882. This read "Tahlequah Drug Store Always on hand a full line of Drugs, Fancy Groceries and Toilet Articles. Physicians' Prescriptions Carefully Compounded at any hour, day or night. An Experienced Druggist always present" (10).

A drug store was in existence in Vinita, Cherokee Nation, in 1877. An advertisement in *The Cherokee Advocate* showed that it was owned by J. T. Cunningham and J. R. Trott, M. D. It was known as the "J. T. Cunningham and Co., Vinita, Drug Store." The same advertisement carried the information that they had enlarged their Drug Establishment and that they carried Stationery, Cigars, Fancy Candy, Tobacco, Window Glass, Putty, Paints, Perfumes, etc., also Patent Medicines and that prescriptions were filled (11).

Another early drug store of the Indian Territory was established by Charles Hokey, January 7, 1888, in Krebs. Mr. Hokey came to the Indian Territory from Missouri in 1876 and worked in the coal mines. He was issued a permit for his drug store by the Choctaw Nation, this yearly permit costing him ten dollars (\$10.00). H. H. Hokey, his 16-year old son, started to work in the store in 1890. He acquired it in 1908. The store is advertised as "Hokey's Drug Store. The Oldest Drug Store in Oklahoma, Since 1888" (12).

The Cherokee treaty established what was known as the Neutral Strip. There was a drug store in Benton County, town of Benton (now Beaver County and the town does not exist) in 1888. This is shown by an advertisement in the Benton County Banner, Friday, August 3, 1888. It read "B. D. Fowler, Proprietor of Post-Office Store, Keeps constantly on hand a full line of DRUGS and Patent Medicines. A choice line of TOBACCOS in connection with stock" (13).

After much agitation by the so-called "Boomers," the Oklahoma Lands were opened for settlement by the white men. The Congress passed this act as a rider to the Indian Appropriation Bill. President Harrison issued the Proclamation on March 23, 1889, that these lands would be open for settlement on April 22, 1889. This was the first of the famous "Runs" for land in the settlement of Oklahoma. It is estimated that from 30,000 to 40,000 people came into Oklahoma on that day (14).

With this vast throng of people came a number of druggists. One of these was C. P. Wickmiller. He had previously been in Oklahoma, having made his earlier trip as the photographer of the Captain David L. Payne's expedition, February 1883. In this expedition there were 133 prairie schooners, over 500 men and three

women He was finally removed from the territory by soldiers, but when he heard of the President's Proclamation, he made preparations to return

He hired two teams and borrowed a yoke of oxen from his father-in-law Fixtures and supplies were loaded on and he started He arrived on time and staked the lot that has been the location of the Wickmiller Drug Store ever since That same afternoon he put up his tent, propped up his sign "Drug Store" and did business on the day of the opening

Mr Wickmiller was born in Prussia in July 1858 and came to the United States at the age of five He attended public school, at the age of six, in Scranton, Pennsylvania, and finished the course Geography was especially interesting to him and caused him to start traveling at an early age He is now seventy-seven years old and has been in all of the states and in fifteen foreign countries

He registered as an Assistant Pharmacist in Kansas in 1885 and as a Pharmacist in 1886 His certificate as Registered Pharmacist in Oklahoma is number four-



Half tone on left shows the first drug store in Chandler, Okla., started by A. D. Wright, September 22, 1891. Mr. Wright is the second man from the right, hand on tent pole. The building on the right later replaced the tent.

teen He has served as president of the State Pharmaceutical Association and as secretary of the Board of Pharmacy

Mr Wickmiller has also taken active interest in the civic affairs of the town and the state he has helped to build He was second mayor of his town, also, chairman of the finance committee that started the first public school and he hired the first teacher He is a past Grand Commander of Knights Templar of Oklahoma His collection of relics, especially Indian, and curios is one of the best private collections in the country (15)

Another of the "Runs" was the opening of the Sac and Fox territory A. D. Wright made this run and established a drug store on September 22, 1891 He was among the early arrivals and staked a good location He erected his tent, erected his sign and was ready for business (see picture) Mr Wright had been in partnership in a drug store in Guthrie, Oklahoma, since late in 1889 The pictures give the development of the Wright Drug Store He is still in business at the same location Mr Wright was born in Beekman, N. Y., February 9, 1863, his father was an undertaker and carriage maker He graduated from the public schools of Beek-

man and from the Wilbraham Academy located in Massachusetts, in 1883 He came to Oklahoma in 1889 (16)

The present Greer County, Oklahoma, was a part of what is known as "Old Greer County " It was originally claimed by Texas and was organized as a County by that State in 1886 This was grass land country and part of the "Cattle Country " This land was awarded to Oklahoma by a decision of the Supreme Court, March 10, 1896 (17) The town site of Mangum, Greer County, Texas, was laid out by H C Sweet in 1884 (18) Dr R C Hannah, a physician from Texas, came there in September 1887 and opened a drug store under the name of R C Hannah and Co , his partner was Dr H M Ferguson The fixtures and supplies were freighted, overland by wagon, from Quanah, Texas An advertisement in *The Mangum Star*, in 1898, gave the information that they were "Dealers in Drugs, Stationery, Staple and Fancy Groceries, Oils, Paints, Varnishes, Books, and Fancy Toilet Articles " A news item in the same paper read "R C Hannah and Co have just put up and sold several nice buggies," and another "R C Hannah and Co are now handling the celebrated Brown wagon They have had a new supply to just arrive" (19) The picture shows some of the stock in about 1915



A number of illustrations accompanied the article showing periods of development The illustration shows Mr Wright's store in Chandler 1915

Dr Hannah died in 1917 and his son, C C Hannah, conducted the store for about six months, when it was sold and the son went to the war The store was reopened, in the same location, in 1933, and is being operated by C C Hannah

The story of early drug stores in Oklahoma is slowly being unfolded It is hoped that more information may be supplied from time to time

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- (5) *Ibid* page 64
- (6) *Ibid*, page 65
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- (8) Emmet Starr "History of the Cherokee Nation" (1921), page 123
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- (12) Private communication from H H Hokey, Krebs, Oklahoma, also *The Daily Oklahoman* October 13 1929
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## MOSES MAIMONIDES—PHYSICIAN AND AUTHOR OF MEDICAL WORKS \*

BY LOUIS GERSHENFELD <sup>1</sup>

Moses Maimonides, the Hispano-Jewish philosopher, theologian, physician and astronomer, is known as Rabbi Moses ben Maimon, and (Rabbi M b M) hence Rambam, often called the Second Moses and known under other names with various honorary titles. He was born in Cordova, Spain, on March 30, 1135, died in Egypt on December 13, 1204, and was buried in Tiberias, Palestine. This year marks the octocentennial of the birth of this most interesting character who is regarded as the greatest of Medieval Jewish writers, thinkers and scholars. His fame as a distinguished, and the most rational, physician of the Middle Ages was, however, overshadowed by his famous reputation as a philosopher and Talmudist.

Maimonides never attempted to employ either the Rabbinate or his scholarly attainments as a means of livelihood. Nothing in all that Maimonides ever wrote, either in his early or later days, exceeds in vehemence his denunciation of those who lived for gain by serving the Synagogue or Jewry with their learning. The teacher, the scholar, the Rabbi, like the Mishnaic sages of old, must live, he argued, by the toil of their hands, just as the layman in Jewish life, and they must not trade their holy knowledge for gain. Let it be said in all fairness that, though this may have been possible before the 14th and during the 13th and earlier centuries, changes later in Jewish life made it impossible for the teacher or Rabbi to perform the many onerous and exacting duties demanded of him, requiring as they did undivided devotion and absorbing his whole mind and heart and all of his time, unless some revenue was derived therefrom to enable him and his family to live. But the fact, nevertheless, remains that Maimonides, who by 1177 was recognized as the official head (Nagid) and Chief Rabbi of the Cairo Jews, and, in fact, of the Jewish community of

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Egypt (Ra's al-umma or al-milla), pursued his Rabbinical and intellectual career throughout his entire life without financial gain from such pursuit. After the death of his brother, Maimonides turned to medicine. He determined to utilize his medical knowledge (which he received from his studies under Rabbinical and Moslem teachers as a part of general culture) as a means of earning his livelihood, and thus, as was so frequently the case with other learned Jews, the Rabbi, the healer of the soul, became also the healer of the body. As a physician he was at first unknown, his practice was not extensive, his fame as a medical practitioner came at a much later period in his career. Accordingly, he had time to give public lectures on philosophical, Talmudic and Rabbinical subjects. Maimonides, however, never established a formal school. He spent much of his time working until the completion in 1168 of his "Sifrj" (or "Light" or "Maor" (Hebrew)) as the "Commentary on the Mishnah" was known.

The ray of sunshine in the greatly troubled life of Maimonides was Saladin. Who knows whether Maimonides would ever have risen to become the most famous Jew of medieval times and one of the greatest Jewish characters of all time had he not been Saladin's contemporary, his subject and, later, physician to his court? It was Saladin who introduced into Cairo the Medresa, or Collegiate Mosque, with its regular courses of instruction in varied fields of activities and with its free popular public lectures. When Saladin's power was supreme, he appointed the Khadi Alfadhel (or al-Qadi al-Fadil al-Baisani), as Vizir. The latter, who (with the cooperation of Saladin's brother, el-'Adil) was practically ruler over Egypt during the last thirty years of Maimonides' life, selected Maimonides in or about 1185, as one of his physicians, allotted him an annual salary and honored him with other distinctions. Alfadhel, as his master, was devoted to culture and education and constantly fostered its promotion. Later Maimonides served as physician to Saladin and to the latter's son.

When in 1187, Western Europe heard of the fall of Jerusalem, a new Crusade was formed so as to recapture the Holy City. The details of the third Crusade cannot be told here. Suffice it merely to mention that Richard I, the Lion Hearted, King of England, was at the head of the latter. When all was over we find that Saladin remained in power and in possession of Jerusalem, which was to remain under the protection of Moslem rule and the Crescent until its capture during the recent World War. In his conquest he was aided by his brother el-'Adil and it was the latter who served as the intermediary between Saladin and King Richard. It may have been that el-'Adil, who later was regarded as the Sultan of Egypt, related the wonderful deeds of Maimonides to King Richard and that Richard may have sought his service as his private physician, an honor which is said to have been declined by Maimonides. If the latter actually received such a request, or if Richard, the Lion Hearted, asked Saladin for his physician, Maimonides more than likely must have or would have declined, as it undoubtedly must have appeared to him unwise to leave a Moslem saint for a Christian brute and savage.

Maimonides practiced medicine with religious fervor, as if the medical art was a holy calling. He himself tells us that the purpose of medicine "was to teach humanity the causes of ill health, the correct dietetic hygiene, the methods of making the body capable of useful labor, how to prolong life, and how to avoid disease. It thus directly elevates the human being to a higher moral plane where the pursuit of



Truth is possible and where the happiness of the Soul is attainable " Those interested in preventive medicine can gather much of interest in Maimonides' writings, for hygiene (and especially dietetic hygiene) is a topic discussed freely and frequently in many of his works He was a staunch advocate of the guarding against, rather than the curing of, disease

His extensive medical knowledge was sought by the court and the general population alike He was admired by the élite, worshipped by the masses and was the favorite of royalty and the idol of their subjects In one of his letters written in 1199 to his disciple Samuel ibn Tibbon advising him not to visit him at that time, he gives a vivid picture of his professional duties which required all of his time, day and night, so that he had but little freedom for himself, even for his meals In spite of these duties, he still fulfilled the functions of Chief Rabbi or Nagid and wrote "Responsa" addressed to all parts of the world His energy was invincible The following extracts from this letter are of interest

' Now God knows that in order to write this to you I have escaped to a secluded spot, where people would not think to find me, sometimes leaning for support against the wall, sometimes lying down on account of my excessive weakness, for I have grown old and feeble I dwell at Fostat and the Sultan resides at Cairo These two places are two Sabbath days' journey (about one mile and a half) distant from each other My duties to the Sultan are very heavy I am obliged to visit him every day early in the morning, and when he or any of his children, or any of the inmates of his harem are indisposed I dare not quit Cairo but must stay during the greater part of the day in the palace It also frequently happens that one or two of the royal officers fall sick and I must attend to their healing Hence, as a rule, I repair to Cairo very early in the day, and even if nothing unusual happens I do not return to Fostat until the afternoon Then I am almost dying with hunger I find the antechambers filled with people, both Jews and Moslems, nobles and common people, judges and bailiffs friends and foes—a mixed multitude who await the time of my return I dismount from my animal, wash my hands, go forth to my patients, and entreat them to bear with me while I partake of some slight refreshment the only meal I take in the twenty four hours Then I attend to my patients, write prescriptions and directions for their various ailments Patients go in and out until nightfall, and sometimes even, I solemnly assure you until two hours and more in the night I converse with and prescribe for them while lying down from sheer fatigue, and when night falls I am so exhausted that I can scarcely speak In consequence of this no Israelite can have any private interview with me except on the Sabbath On that day the whole congregation or at least the majority of the members, come to me after the morning service when I instruct them as to their proceedings during the whole week, we study together a little until noon, when they depart Some of them return and read with me after the afternoon service until evening prayers In this manner I spend that day I have here related to you only a part of what you would see if you were to visit me "

All of his medical writings were written in Arabic Though these contain summaries, classifications and elaborations of Galen's writings derived in the main from the standard Arabic Galenism of his day (from such authors as al-Rāzī (Rhazes) (born about the middle of the 9th century, died 923 or 24), al-Tamīmī, Ibn Sīnā (Avicenna) (980-1037), Ibn Wafid, (997-1074), 'Alī ibn Ridwān (998-1061 or 1067), and Ibn Zuhr (Avenzoar) (1091 or 94-1161 or 62)), they are tempered with his own critical knowledge gained through his extensive experience by direct observation and by actual experimentation His most popular medical work, generally spoken of as Moses' Aphorisms or Moses' Medical Aphorisms or Principles, was the Kitāb al-fusūl fī-l-tibb or Fusūl Mūsā, (known in Hebrew as Pirke Moshéh), written about 1187-1190 It is a collection of 1500 aphorisms extracted from

Galen's writings, together with 42 critical remarks Galen's thoughts were classified in 24 chapters devoted respectively to

Chapters (1-3), anatomy, physiology, general pathology, (4-6), symptomatology and diagnosis, with special reference to the pulse and urine, (7), etiology, (8-9) general and special therapeutics, (10-11), fevers and crises, (12-14), bloodletting cathartics emetics, (15) surgery, (16), gynecology, (17), hygiene, (18), gymnastics massage, etc., (19), bathing, (20) dietetics, (21-22), drugs, (23), Galenic ideas which are often misunderstood, and (24), rare cases. In a final chapter (25), the author outlines a general criticism of Galenic medicine and philosophy, indicating some forty topics about which Galen contradicted himself. It ends with a discussion of Galen's teleological ideas from the Biblical standpoint. This last chapter the most important of the work, was apparently unfinished at the time of Maimonides' death, as it was edited posthumously by the latter's nephew Yūsuf ibn 'Abdallāh Abū l-Ma' āli, in 1204-1205.

Next in popularity only to the *Fusūl* was the *Māqāla fī-tadbīr al-sihha*, known popularly as the *Tadbīr al-sihha*.

This is composed of four books on diet and personal hygiene and was addressed about 1198 to al Mālik al Afdal Nūr al dīn 'Alī, Saladin's eldest son. The latter suffered from fits of melan cholia, and requested from Maimonides, his chief physician, a regimen. This work a compilation obtained from ancient and Arabic writings and published first in Hebrew in the Journal 'Kerem Hemed' (III, 9-31), is divided into four parts, as follows: (1) explanations of the case, and general hygienic and dietetic rules, with frequent references to Hippocrates and Galen, (2) easy remedies for use while traveling, or when a physician is not available, (3) hygiene of the soul, psychotherapeutic rules partly derived from Aristotle and from al Fārābī, (4) summary of hygiene and dietetics in the form of seventeen aphorisms. The *Tadbīr al sihha*, or Maimonides' work on personal hygiene and dietetics is of interest from many viewpoints. Therein, with bitter sarcasm and much irony he deplores the low and degraded state of the medical profession during his time and the apparent success of various charlatans and bragging healers. He stresses the necessity and importance of a detailed and thorough professional training for medical practitioners and also the need of careful personal attention to one's patients. Details are given concerning the relation between the patient and his physician, and vice versa. Of interest is his statement that slight indispositions may, whenever possible, be treated without any special help of physician or drugs, but a catarrh, he warns, must not be taken too lightly. Though Galen and Hippocrates are frequently quoted in this work, he gives his own views on personal hygiene and dietetics which are of interest. In this work as well as in others, one finds that his whole theory of health is thus condensed into two brief rules: "A man should not eat too much, nor should he give up exercise." He constantly warns against satiety and overloading the stomach. Among some of the thoughts promulgated and rules given in this treatise as useful for the preservation of health the following excerpts are of interest:

If a person took as good care of himself as he does of his domestic animal he would avoid many diseases. No one throws food to his animal without measure but he feeds it in accordance with its needs, yet he himself consumes food without any measure or control. One should also take into consideration the moving around of domestic animals and the exercise they get lest they become stiff and perish. He, however, does not do that with himself and neglects exercising his body, which is the greatest support of good health and a ward against many diseases. In speaking of physical exercise, he continues: "We have mentioned the saying of Hippocrates: Continuation of good health depends on being careful of sluggishness." Indeed there is not a thing that could take the place of exercise, for with exercise the natural heat gets inflamed and all waste matter is thrown off, whereas inertness extinguishes the fire of the natural heat, and the superfluities of the body are not thrown off 'but not every movement of the body is considered by physicians as exercise.' Only a vigorous or quick movement, or both combined could be termed exercise. It is with the vigorous movement, resulting in change of breathing that the person begins to breathe deeply. A movement stronger than that brings about a fatigue; a very strong exercise causes fatigue which not every one is able to stand and there is no particular necessity in that, the most beneficial for the preservation of health being the brief exercise.

"One should exercise on an empty stomach only, and after the excrements are thrown off

(urine and bowels) Likewise, exercise should be avoided in excessive heat and excessive cold, the best time for it is early in the morning after one gets up from his sleep and throws off the excrements. To the general principles for the preservation of good health, promulgated by Galen belongs the following 'Just as movement before eating is altogether beneficial so is movement after eating quite injurious.' By this is meant the avoidance of heavy exercise after eating as well as coitus and bath, which are very harmful, especially to those who naturally have thin and narrow veins. Yet it is advisable to move around lightly after meals from one end of the room to the other until the food is well settled in the stomach and rests there until digested. Sleep helps digestion especially with those who are in the habit of sleeping in the day time."

In his opinion the best of sports are throwing a ball and wrestling. Old men should not fail to go in for physical exercise of some kind. Maimonides details the quality of different foodstuffs, and warns against the use of food which has begun to deteriorate. He recognizes that milk may affect individuals differently and in speaking of milk products he says "Fresh milk is a good food for those in whose stomach it will not sour, nor ferment, nor form flatulence in the region below the loins. Galen recommends that one should add to the milk a little honey and a pinch of salt, so as to avoid its curdling in the stomach. The best kind of milk is the tenderest, such as milk of goats or of the camels which is also good. Whatever is prepared from milk or is mixed with it is very unhealthy, such as curdled milk, sweet or sour milk mixed together and whey. Likewise all that is cooked of milk and in milk is unwholesome as food. Cheese is a poor and heavy food except the fresh white cheese which is sweet of taste and contains little fat. Galen praises it as a nourishing food. Other kinds of cheese are objectionable, especially the old cheese containing much fat. Fresh and melted butter is not a bad food for anybody." On the whole, Maimonides warns that one should be careful in the selection of fresh fruit which is to be consumed. This is perhaps due to the fact that many infections prevailed during the early days when eating raw fruits and vegetables not washed or cooked properly or peeled. He says "Vegetables which generally are not wholesome as food are garlic, onions, leek (related to the onion), radishes, cabbage and egg plant, and people who take care of their health should avoid them. Cantaloupe is easily digestible when eaten the first thing in the morning on an empty stomach, having no flow of bad secretion and not containing any bad mixture. It has then a slight cooling effect on the body, throws off the urine and cleans the veins of impurities, it being thus a wholesome food. I have mentioned it here, for it is used much by people."

In regard to fresh fruit it is well to know that whatever grows on trees cannot be generally recommended as food. Yet some fruit is not as bad as others, so carobs, fruit of the lotus tree, and the medlar are quite wholesome, whereas figs and grapes are not nearly so bad, in fact almost wholesome as Galen speaks of figs and grapes as chiefs to all fruit. They are, indeed, the least injurious yet one should not overtax the blood which is required for digesting all fruit (e.g., one should not eat too much of this fruit). My statement that whatever grows on trees cannot be recommended as food must not be misunderstood, in view of the fact that fruit juices as well as sirups and confections prepared from fruits are beneficial as medicine in various diseases for the virtue of foods as food is different from their virtue as remedies for diseases, this is quite evident to those versed in the medical art."

"There is a statement of Galen in which he offers a solemn advice to people that they should not eat any fruit. He says that every year he used to suffer from fever, then following his father's advice completely to abstain from eating fruit, and since then up to the time he wrote his treatise he suffered from fever only one day. The fact that many people eat these fruits yet do not suffer from fever is no proof to the contrary for change in habits and variety in dispositions bring about different rules. If the Hindu, e.g., ate well prepared bread and mutton meat he would surely become ill and on the other hand, if one of us limited his diet to rice and fish as the Hindus do he would likewise become ill. However the purpose of this treatise is not to cite the causes thereof but its aim is that we know that, generally speaking, fruits are not wholesome and should be eaten in moderate quantity. They must not be mixed in any form with other foods. Fruits that act as laxatives such as plums, grapes and figs are to be consumed before the meal which is to be taken only after the former is emptied from the stomach, whereas those that act as astringents as quinces and pears should be taken after meals in moderate quantities as much as to have their fragrance in the stomach. Just as figs and grapes are the best of fruits so are peaches and apricots the worst among them. The latter two cannot be digested at all, an ap

preciable quantity of waste matter remaining in the veins mixed with the blood where it eventually boils, thus causing the inception of putrid fever "

"Dried fruits such as raisins, dried figs, kernels of pistachio nuts, kernels of dry almonds, are not unwholesome, however, they are recommended as beneficial after meals, especially raisins and pistachio nuts which are very good for the liver, and 'A healthy liver is our life,' as Galen said. In a similar manner it is good to take a little of sweet dessert after the meal in order to enable the stomach to envelope the food and digest it properly " His *Maqāla fi l-bayān al-ā-rād* (Discourses on the Explanation of Accidents) regarded by some as the continuation of section five of his work on diet, was written for the same prince al-Afdal who was then residing at Riqqua in Upper Egypt. This work, known in Hebrew as *Teshubot 'al she 'elot peratiyyot* and in Latin as *De causis accidentium apparentium* is divided into 22 chapters. Written about 1200, it apparently was Maimonides' last medical effort. Therein are contained many prescriptions, formulas of other physicians with his own criticisms gently expressed, and prescriptions by himself follow, which are of interest because of their simplicity and medicinal value.

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The *Maqāla fi l-rabw* (a work on asthma) written about 1190 contains 13 chapters dealing with diet and climate in general with a discussion of the climate and food of different countries, particularly of Egypt. The best diet and climate for asthmatics follow. His treatise on hemorrhoids (*Māqala fi l-bawāsir*), known in Hebrew as *Ha ma 'amar bi refu 'at ha tehorim*, is composed of seven chapters. He ascribed hemorrhoids to bad digestion mainly to chronic constipation, and advocated a light diet predominantly vegetarian. Mild purgatives, enemas and laxatives are described. He mentioned the danger of bloodletting describes a method of drying up

(urine and bowels) Likewise, exercise should be avoided in excessive heat and excessive cold, the best time for it is early in the morning after one gets up from his sleep and throws off the excrements To the general principles for the preservation of good health, promulgated by Galen, belongs the following 'Just as movement before eating is altogether beneficial, so is movement after eating quite injurious' By this is meant the avoidance of heavy exercise after eating as well as coitus and bath, which are very harmful, especially to those who naturally have thin and narrow veins Yet it is advisable to move around lightly after meals from one end of the room to the other until the food is well settled in the stomach and rests there until digested Sleep helps digestion especially with those who are in the habit of sleeping in the day time "

In his opinion the best of sports are throwing a ball and wrestling Old men should not fail to go in for physical exercise of some kind Maimonides details the quality of different foodstuffs, and warns against the use of food which has begun to deteriorate He recognizes that milk may affect individuals differently and in speaking of milk products he says "Fresh milk is a good food for those in whose stomach it will not sour, nor ferment nor form flatulence in the region below the loins Galen recommends that one should add to the milk a little honey and a pinch of salt, so as to avoid its curdling in the stomach The best kind of milk is the tenderest such as milk of goats or of the camels, which is also good Whatever is prepared from milk or is mixed with it is very unhealthy such as curdled milk sweet or sour milk mixed together and whey Likewise all that is cooked of milk and in milk is unwholesome as food Cheese is a poor and heavy food, except the fresh white cheese which is sweet of taste and contains little fat Galen praises it as a nourishing food Other kinds of cheese are objectionable especially the old cheese containing much fat Fresh and melted butter is not a bad food for anybody " On the whole, Maimonides warns that one should be careful in the selection of fresh fruit which is to be consumed This is perhaps due to the fact that many infections prevailed during the early days when eating raw fruits and vegetables not washed or cooked properly or peeled He says "Vegetables which generally are not wholesome as food are garlic, onions leek (related to the onion) radishes cabbage and egg plant, and people who take care of their health should avoid them Cantaloupe is easily digestible when eaten the first thing in the morning on an empty stomach, having no flow of bad secretion and not containing any bad mixture It has then a slight cooling effect on the body, throws off the urine and cleans the veins of impurities it being thus a wholesome food I have mentioned it here, for it is used much by people "

In regard to fresh fruit it is well to know that whatever grows on trees cannot be generally recommended as food Yet some fruit is not as bad as others so carobs fruit of the lotus tree, and the medlar are quite wholesome, whereas figs and grapes are not nearly so bad, in fact almost wholesome as Galen speaks of figs and grapes as chiefs to all fruit They are, indeed, the least injurious yet one should not overtax the blood which is required for digesting all fruit (i.e. one should not eat too much of this fruit) My statement that whatever grows on trees cannot be recommended as food must not be misunderstood, in view of the fact that fruit juices as well as sirups and confections prepared from fruits are beneficial as medicine in various diseases, for the virtue of foods as food is different from their virtue as remedies for diseases, this is quite evident to those versed in the medical art "

There is a statement of Galen in which he offers a solemn advice to people that they should not eat any fruit He says that every year he used to suffer from fever then following his father's advice completely to abstain from eating fruit and since then up to the time he wrote his treatise he suffered from fever only one day The fact that many people eat these fruits yet do not suffer from fever is no proof to the contrary for change in habits and variety in dispositions bring about different rules If the Hindu, e.g., ate well prepared bread and mutton meat he would surely become ill and on the other hand, if one of us limited his diet to rice and fish as the Hindus do he would likewise become ill However, the purpose of this treatise is not to cite the causes thereof but its aim is that we know that generally speaking fruits are not wholesome and should be eaten in moderate quantity They must not be mixed in any form with other foods Fruits that act as laxatives such as plums, grapes and figs are to be consumed before the meal which is to be taken only after the former is emptied from the stomach, whereas those that act as astringents as quinces and pears should be taken after meals in moderate quantities, as much as to have their fragrance in the stomach Just as figs and grapes are the best of fruits so are peaches and apricots the worst among them The latter two cannot be digested at all an ap

preciable quantity of waste matter remaining in the veins mixed with the blood, where it eventually boils, thus causing the inception of putrid fever "

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hemorrhoids by vapor treatment and in considering surgical intervention, he says that this should be reserved for extreme cases. His thoughts concerning bloodletting reveal them to be ahead of his time. Though advising against this method and stating that it should not be employed for children and very old people, he presents the conclusion that it should not be the age of the patient which should decide the practice of this technique, but its use should be governed by the general physical condition of the patient.

A collection of extracts from Galenic writings, the *Mukhtasarāt* (abridgements, digest) (lost in its original Arabic but available in Hebrew translations) and a commentary on Hippocrates' Aphorisms are to be found among his medical works. Other medical writings ascribed to him are the *Sefer refu'oth* (Book of remedies or medicines) in Hebrew, and the *Kitāb al asbāb wal alāmāt* (Causes and Symptoms) in Arabic. It is of interest to note that in his many writings on methods of treatment he reveals a marked opposition to polypharmacy (complicated mixtures of medicaments). He recommends only simple remedies and would only use drugs which he himself tested or which had been found satisfactory and in turn recommended by recognized medical authorities. In minor ailments "he wrote, Nature cures the body without the need of medicinal remedies, if the patient only follows certain dietetic regulations. Where, however, the services of a physician are required, he should see to it that he aids Nature in her beneficial course. Most of the doctors err in their treatment. In endeavoring to assist Nature they weaken the body with their prescriptions."

The Physician's Prayer, ranking as it does with the Oath of Hippocrates (matching the latter and completing it from the Jewish viewpoint), has been widely circulated and is a valuable contribution to medical deontology. It is ascribed to Maimonides and is most frequently known as Maimonides' prayer. However, there is no genuine proof that this was composed by Maimonides, though many regard it as Maimonidean in tone and spirit.

Brief comments should be made here of the three of his greatest works, a trilogy. Though they are included among his Rabbinical and philosophical writings, information concerning medical subjects are to be found therein. His first great work was the *Sirāj* (or *Light* (or *Maor Hebrew*)) or his *Commentary on the Mishnah*. A physician, "he says in this *Commentary on the Mishnah*, should begin with simple treatment, trying to cure by diet before he administers drugs." It is of interest to note that in his *Responsa* he applies this principle to spiritual illness as well. The following opinion voiced almost 800 years ago by Maimonides can be aptly applied to day. Like unto a murderer, he wrote, "is the physician who refuses to tender his assistance in time of necessity, or who practices without undue study of the ailment which he is treating." Maimonides warns individuals against marriage with any one from the family of a leper or epileptic or one incapable of propagation. He states that a healthy man needs, on the average, eight hours of sleep. He should get up early, best of all before sunrise. He warns changing a habit suddenly, or he will fall ill, and he states, "If a habit is pronounced bad for a patient and is to be given up, it should be done gradually. Drastic cures ought never to be undertaken alone but only under the supervision of a physician."

The *Mishnah Torah* or *Double of the Torah* (Repetition of the Law, Deuteronomy) or *Strong Hand* (*YaD ha Hazaqah*) (*Sefer ha yad*) (written in new Hebrew not Hebrew Arabic) is the first complete digest, classification and codification of all the Mosaic and Rabbinical laws. It is enriched with much of his own philosophical and scientific thought and contains material derived by industrious work and compilation not only from the Torah and from both Talmuds but also from the Geonim, the whole consisting of 1000 chapters being classified in fourteen books or sections. In this work one finds the whole of Jewish jurisprudence, religious, civil and criminal, astronomical knowledge and medical information coupled with a considerable amount of general data and philosophical thought. It is difficult to appreciate the significance of this masterful and gigantic work. Regarded by many as the greatest work in Jewish literature after the Bible, it has obtained a semi-canonical status in Israel.

The most famous work written by Moses Maimonides and which crowned his reputation was the *Dalālat al Hā'irīm* or *Guide for the Perplexed* (or *Moreh nebukim* (Hebrew), (or *Doctor perplexorum*)) completed in 1187-1190. Written in Arabic, the original text was given in Hebrew characters. Translations in French, Hebrew, Latin, Italian, German, Spanish and in English are available. A better translation of *Dalālat* is guidance, and *A guidance for the perplexed* is what Maimonides intended this work to be. This treatise appeared in the form of letters ad

dressed to his disciple Josef ibn 'Alum, and was sent to him chapter by chapter as Maimonides completed them. It was not intended for the multitude or the masses, but it was written from a philosopher to the philosophically inclined (to the select). He attempted to bring mental peace and spiritual comfort to the "perplexed" and the result was his Guide. His purpose of this work was to reconcile faith with reason, to reconcile Aristotelian philosophy and thought with Jewish theology and the doctrines of Judaism. This was something new, something original, something never attempted before by any Jewish thinker. To some extent he championed science against the fundamentalism of the Bible, though he was at all times honest and consistent in the belief of the truth of the Aristotelian system and convinced of the truth of the Mosaic doctrine and of the Divine origin of the Torah. Though much can be said pro and con for this and other of his works, at least Maimonides must be credited with the fact that he pointed out that philosophy and science did not begin nor did it end in the Scriptures and Talmud. Of interest is Maimonides' comment in this work concerning wine. One must remember that this and other spirits were forbidden the Arab by his religion. Though in a dilemma, he mentions its useful and wholesome properties. "He who is careful concerning it (wine) will be called a saint, wine in early and later days has driven many to perdition. He is wrong who believes that to be drunk once a month is useful. A youth under 21 should never touch wine. The older a man gets however, the better wine is for him, and the very old need it most. Wine in small quantities is good for digestion, it is a tonic even a remedy for many diseases. It does away with heavy, melancholy thoughts, and induces good sleep."

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#### LOUISVILLE COLLEGE OF PHARMACY STUDENT BRANCH

The regular monthly meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION Student Branch of the Louisville College of Pharmacy was called to order on April 1st at 2:30 P.M. by President Wm. J. Walsh. All members were in attendance.

The minutes of the March meeting were read and approved. The treasurer reported a balance on hand of \$21.70.

The special program consisted of two papers, ably prepared and presented by Fred P. Kranz, Jr., on "Phenol" and by Claude M. Lloyd on "The Official Remedies for Burns." A discussion of the papers followed.

The Program Chairman, Horace Hannon, announced that Dr. Virgil Simpson would be the speaker for the May meeting. Motion was made and carried that the entire student body be invited to attend the May meeting and also to invite the Kentucky A. P. H. A. members to attend.

JOE BLACK Secretary

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#### COMPLETE DRUG STORE PRESENTED TO TEMPLE UNIVERSITY

A complete model drug store has been presented to the Temple University School of Pharmacy by Sharp and Dohme. Presentation of the store was made by President J. S. Zinsser who said he hoped it would be dedicated "to the promotion of professional and ethical pharmacy and also the means of a better approach to the practice of professional pharmacy."

The model store will be used as a background for the practice of professional pharmacy. Dr. Charles E. Beury, president of Temple University, accepted the store in behalf of the University. He also thanked Dr. H. Evert Kendig, dean of the Pharmacy School for his efforts in securing planning and installing the store.

#### MISSISSIPPI PHARMACY BOARD NAMED BY GOVERNOR

The Mississippi State Board of Pharmacy selected from nominees proposed by the Mississippi State Pharmaceutical Association, was appointed by Governor Hugh White. Kelly Patterson of Jackson, J. J. Gerache, of Vicksburg, Lew Wallace, of Laurel, W. H. White, of West Point and T. H. McMillion of McComb.

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The 84th Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Dallas, Texas August 24-29, 1936. Hotel Adolphus Headquarters.

Conferences, Sections and Committees note that the time for the meeting is fast approaching.



# THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS  
DEPARTMENT

The value of placement tests such as are usually given during the orientation period to students entering college depends upon the intelligent use that is made of them. Some instructors believe that they are of little or no value and therefore cast them aside. Others place too much confidence in them as indicators of the progress that a student should make in college. The wise instructor is willing to withhold judgment until he has determined the correlation (or lack of correlation) between the results of these tests and the work that a student does in college. The following papers by Drs McMurray and Lee give their results of such a study. Therefore, these papers should be of considerable interest to any instructor who is endeavoring to make use of placement tests.—C B JORDAN, *Editor*

## THE 1935 COLLEGE OF PHARMACY ENTRANT \*\*

BY R L MCMURRAY \*

Within and without the ranks of Pharmacy<sup>1</sup> questions continually confront us as to how we are keeping pace commercially, professionally and educationally with contemporary fields. Commercially you know the answer. Drug stores in 1933 marketed<sup>2</sup> \$1,066,252,000.00 worth of products. Professionally you know the answer in up-to-date apothecary shops, hospital pharmacies, synthetic remedies and general scientific progress. But few know how the College of Pharmacy has progressed in its determination to graduate a better pharmacist.

After the World War there was a rush into education of returned soldiers, government employees and others, who had, for various reasons, deferred their education. In addition the enrollment included students of normal age, but who had attended school during the influenza epidemics and the general hysteria more or less prevalent to that war period. At that time the common trend was to choose the two-year course in Pharmacy and rush back to the retail business. Thus, the pharmacy student body for a period of more than five years following the War was composed of an extraordinary lot of individuals.

About the time of the World War new methods for testing the student's mental ability became the chief interest of a certain group of educators. All students in the University were subjected to intelligence tests—otherwise known as the "nut tests." And while the size of a Hottentot may not have any direct bearing on the proper method to prepare an emulsion of cod liver oil, nevertheless the results of these tests were not flattering to the relative standing of pharmacy students as compared with students in the other colleges of the Ohio State University. I am still very much conscious of the shock experienced during my freshman year when in the dean's office for the first time. There I noticed that the results of the intelligence tests had been plotted on a chart and that the College of Pharmacy students had the lowest intelligence rating for any group of students in the Ohio State University.

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\* College of Pharmacy, Ohio State University

\*\* Presented before meeting of Boards and Colleges of Pharmacy of District No. 4, 1936

<sup>1</sup> *Drug Topics* 51 No. 43, 17 (1935)

<sup>2</sup> U. S. Dept. of Commerce, Census of American Business, 1933 (May 1935) 7

The direct result of graduating these students from the College of Pharmacy has been an overproduction of registered pharmacists with subsequent deleterious effects upon the general tone and morale of pharmacy. Unregulated overproduction tends to follow economic laws. The hours of work were lengthened and the wages decreased until many self-respecting men refused to engage any longer in retail pharmacy work. Many left the retail pharmacies. I know of many who turned to other fields—and they are not second-rate men either. For instance, one man who graduated in 1925 is now advertising manager for a large unit of a newspaper chain in a town of 400,000 people. Another registered pharmacist is a successful house-painting contractor in a town of 50,000.

To-day the cry and demand of Retail Pharmacy is for protection. In the education branch of pharmacy this cry has not come to stoppered ears, but a College of Pharmacy functioning as a unit of a state-supported university must offer its services unbiased to all who apply in a regular manner for admission as students. Therefore, the College of Pharmacy at Ohio State University has been limited in the matter of selecting students for it must constantly bear in mind that the spirit of education in the United States is equal opportunity for all. However, the graduating of a capable type of student will add very much to the protection that pharmacy is seeking to obtain. There are a number of factors in the retail business that might be non-desirable but the elimination of these factors cannot be accomplished overnight. In some cases the student of to-day will be the one who will eventually carry on the fight. Therefore, if the college attracts and educates the very best graduates of the high school then it has furnished the essential material for bettering Pharmacy, for no profession will ever rate above the members composing its body.

A tabulation has been made of entering students at the Ohio State University in the fall quarters of 1924, 1925, 1934 and 1935. The last year for admittance into the two-year course was 1924. The state laws require that the Ohio State University accept all graduates of accredited high schools within the state. Therefore, the student body cannot be selected as private schools do. However, the course of study could be lengthened and this was done, with gratifying results, as herewith shown. The figures for these two sets of years follow.

In the autumn of 1924, 119 students were admitted into the College of Pharmacy, of whom 2.52% were in Class I, 12.6% in Class II, 52.81% in Class III, 21.08% in Class IV and 10.92% in Class V. Ten years later, in the fall of 1934, 50 students were admitted, of whom 8% were in Class I, 24% in Class II, 60% in Class III, 8% in Class IV and 0% in Class V. In other words, there was an increase of 16.88% of students in the upper two ranks in the year 1934 over the year 1924, based on the results of the intelligence tests.

In the following set of years, 1925 and 1935, the same improvement was noted. In 1925, 60 students were admitted, of whom 5% were in Class I, 11.66% in Class II, 45% in Class III, 25% in Class IV and 13.33% in Class V. Ten years later, 1935, 63 students were admitted, of whom 11.11% were in Class I, 23.8% in Class II, 58.73% in Class III, 3.17% in Class IV and 3.17% in Class V, thus showing an increase of 18.25% in the upper two classes over 1925.

These figures are summarized from the results of the intelligence tests. They indicate what the student is supposed to be able to do.

There is another way to measure the student, and consequently the pharmacy student That is by the grades made in high school and relative standing in the high school class

In the autumn of 1935 the College of Pharmacy at Ohio State University accepted 48 students who had no previous college training Transfer and reinstated students were excluded from this study The high school records of the applicants were examined and classified into thirds on the basis of high school achievements This classification was made by an impartial committee working under the direction of the University Entrance Board This same committee appraised the merits of all applicants for all the colleges in the University It was found in studying the records of the pharmacy students that only 12.5% were in the lower third, 41.66% in the middle third and 45.83% in the upper third Thus when the pharmacy freshmen of 1935 were studied in relation to all the other students admitted to Ohio State University it was found that the college was getting three times as many upper third students as there were in the lower third group

Again, a study was made of our freshmen pharmacy students in relation to the total number of graduates from high schools represented Thus, this study was made on figures pertaining not only to students who gained admission to Ohio State University, but to the entire remainder, whether they went to some other college or whether they discontinued school Because of incomplete data filed, the basis of this study was limited to 28 students By the same method of grouping it was found that 10.71% were in the lower third of their high school class, 32.14% in the middle third and 57.14% in the upper third of a total of 3680 students in the graduating classes of the high schools represented In other words the majority of the freshman class of 1935 came from the upper third of their high school class

It is unfortunate that the present system of entrance credentials was not used during past decades This lack of data has prevented a comparison with students of former years with the degree of accuracy obtainable for the period just studied

The conclusion to be reached from a study of these entrance statistics must be made after giving due consideration to the changes in the curriculum of the College of Pharmacy in the 12-year period The last year for students to be admitted in the two-year course was 1924, and thereafter the four-year course only was in effect Therefore, this is probably the earliest that a check could be made to determine the benefit to be derived from the higher academic requirements These changes, plus more adequate quarters and a constant study of newer and better methods in use throughout the profession, lead the faculty of the College of Pharmacy at Ohio State University to believe that a better class of students is being attracted to the profession of Pharmacy, and that the four-year course has been of marked benefit in this respect

#### OUR EDUCATIONAL LOSSES \*

BY C O LEE <sup>1</sup>

In the fall of 1926, Purdue University gave orientation examinations, for the first time, to all the freshmen coming into the University These tests were eight

\* Presented before meeting of Boards and Colleges of Pharmacy of District No 4

<sup>1</sup> Professor of Pharmacy Purdue University

in number, divided into three main groups as follows *First*, general ability tests including intelligence examination and the "Purdue Reading Test, Comprehension" The second group included subject matter ability tests under which were given, Chemistry Aptitude tests, Mathematics Aptitude tests, Physics Aptitude tests and English Aptitude tests The third group included subject matter training tests under which were the English Training Test and Study Outline Test Since that time the number of tests has been reduced to the following four Chemistry Test, Purdue English Test, Psychological Test and Mathematics Training Test It should be stated that the present chemistry test is for those students who have had chemistry and is given for purposes of classifying the freshmen in the chemistry courses Since all pharmacy students are required to enroll in the beginning chemistry courses, irrespective of their previous knowledge of the subject, they are not required to take the examination In reality, then, our freshmen are required to take but three entrance examinations

During these ten years the students of the School of Pharmacy have taken these tests along with the other entering students We have watched, with considerable interest, the results of these examinations and tests As instructors of these students, we should not be too greatly influenced by the results of these examinations for two reasons The first is that it has become a sort of tradition about the campus that high scoring students are expected to do more and better work than those of low scores Those who take the suggestion seriously might make an unjust score for themselves and be wrongly classified and in turn misjudged The second is that the instructor, in looking over the records, might easily be influenced either against or in favor of the student We have tried not to allow the results of these examinations to influence our judgment or feeling with respect to the student until we have had him in class for a considerable number of weeks After we have become acquainted with the student and then find that he is doing rather badly in his work, we may refer to the examination records to see whether the student has ability, according to these tests, to carry on the work that has been assigned to him I sometimes resort to them to help clear up my questionings with respect to certain students If I find that their work has been unsatisfactory and that their test records show that they were low ranking students, I feel more confident in passing judgment as to whether they should be allowed to continue the course or be advised to drop it This again is a bit dangerous because we have had a number of students with comparatively low orientation records, yet possessed with certain qualities of determination and willingness to work, who have made very desirable records On the other hand, we have had students enter with splendid orientation records who, because they lacked these qualities, have been failures, or at least have not been very successful students

In looking over our records of entering students for the past ten years and checking the number who have entered against those who have graduated, we find a very decided loss in the number who have been able to carry through the four years required at the University This naturally causes us to ask ourselves, what has happened to these students who have fallen by the wayside? Perhaps we should not be too greatly concerned about our losses, yet it would seem that it is a problem worthy of some consideration It is rare that we graduate as seniors more than 50% of the entering freshman class We know considerable about those men

who have stayed with us through the four years and have become rather well acquainted with them during their college careers. Those, however, who remained with us one, two, three and sometimes as long as four semesters, and then dropped out of the University, were soon lost from our knowledge. This report is an account of those students who came to us as freshmen, and a record of what happened to them in the University. It is interesting to note that some stayed for a few weeks, some a few months, some as long as two years and then dropped out of sight and we have not heard from them since. Should we be concerned about them? It seems that we should, because without doubt a number of students who have dropped out for financial causes, or failure in grades, might well have been saved. A number of people who have had their college careers cut short for various reasons might have proved to be very good students and worthy of graduation.

#### STUDENTS AND THE RANKING GROUPS

From the records the entering students have been classified with respect to the results of the examinations given them into decile groups and I have shown the number of each class that fall into the various deciles from the lowest to the highest. The School of Pharmacy of Purdue University from 1926 to 1936 has had 448 students enrolled. These are all shown in Table I, which follows. It is interesting to note that 73% of our students fall in the lower five decile groups and only about 26% are included in the upper five groups. Again it will be seen that about 41% of our students fall into the three lowest decile groups and only about 10% of them in the three highest decile groups.

TABLE I—DECILE GROUPS

Year	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Misc	Total
1926	4	6	15	8	7	4	9	2	1	0	4	60
1927	2	5	7	12	8	5	3	1	3	2	1	49
1928	8	6	10	9	9	2	3	3	1	1	3	55
1929	5	7	4	6	3	2	3	4	0	0	0	34
1930	3	5	3	6	3	5	5	4	1	0	0	35
1931	4	8	4	4	5	3	2	2	0	1	0	33
1932	1	7	8	5	4	3	1	3	1	0	0	33
1933	1	3	7	3	11	4	2	3	3	0	0	37
1934	5	8	9	2	12	4	3	1	1	0	0	45
1935	13	7	6	11	13	4	6	6	1	0	0	67
Totals	46	62	73	66	75	36	37	29	12	4	8	448

From our experience and observations, we have come to feel that those who fall into the lower first and second deciles have a difficult time in carrying the university load in the School of Pharmacy. Those who fall in the third decile group can usually carry the work by considerable diligence and application. We have found that those who place themselves, by examination, in the fourth, fifth and upper decile groups can carry the work rather easily and oftentimes can do distinctive work, according to the standards set up by the University. While about twenty six per cent of our students place themselves, according to these examinations, in the upper five decile groups, it is quite disappointing to know that the students who, by these examinations, display superior ability often do just enough to get by and do not distinguish themselves scholastically. This, of course, does not apply

to all of the students, but it is entirely too general as far as we are able to see, and is not confined alone to students in the School of Pharmacy

Reference was made, early in this discussion, to the fact that we have a number of students who come and stay with us for a short time, drop out of the University and are never heard from again. In our files we find such notes as these "Put on probation," "probation continued," "dropped by faculty action" and so forth. Beyond this we have not followed them.

It not infrequently happens that some of our students, who fell by the scholastic wayside, have gone out into business and are prosperous. This is all well and good, for perhaps such students were not happy in their college life and are much happier out doing something in the world of business. However, there is a possibility that some have left the University with disappointments and memories of failures that may mar their lives.

The University, however, tries all possible means to correct or alleviate any such stigma that might come upon the lives of these young men and women. This is not an easy thing to do in many cases.

TABLE II

Decade	1926			1927			1928			1929			1930			1931		
	T	* C	<sup>1</sup> L	T	G	L	T	G	L	T	G	L	T	G	L	T	G	L
1- 10	4	3	1	2	0	2	8	3	5	5	0	5	3	0	3	4	1	3
11- 20	6	1	5	5	1	4	6	1	5	7	2	5	5	1	4	8	3	5
21- 30	15	6	9	7	0	7	10	3	5	4	3	1	3	1	2	4	0	4
31- 40	8	7	1	12	6	6	9	5	4	6	4	2	6	1	5	4	3	1
41- 50	6	1	5	8	3	5	9	8	1	3	1	2	3	0	3	5	2	3
51- 60	4	2	2	5	4	1	2	1	1	2	1	1	5	4	1	3	2	1
61- 70	9	5	4	3	2	1	3	1	2	3	3	0	5	2	3	2	1	1
71- 80	3	2	1	1	0	1	3	2	1	4	2	2	4	4	0	2	2	0
81- 90	1	1	0	3	1	2	1	1	0	0	0	0	1	1	0	0	0	0
91-100	0	0	0	2	1	1	1	1	0	0	0	0	0	0	0	1	1	0
Totals	56	28	28	48	18	30	52	26	24	34	16	18	35	14	21	33	15	18

\* T = Total

<sup>1</sup> G = Graduated

<sup>2</sup> L = Lost

Table II is a summary of those students who entered the School of Pharmacy during the years 1926 to 1931, inclusive. All of those who entered during these years have either graduated or have left the University for other reasons. A glance at this table will indicate that we have at no time graduated more students than were lost from the school. In fact about 45% of those who entered were graduated. The remaining 55% left the University for various reasons. A majority of those entering before 1930 were enrolled in the three-year course.

It is a story that does not indicate very high educational efficiency, perhaps, but we hardly know just how badly we should feel about it. The thing that is disturbing is the fact that nearly 30% of the lowest ranking students have remained on and graduated while a number of the higher grade students have not graduated.

These facts are shown in Table III following, where the 258 students entering pharmacy from 1926 to 1931, inclusive, are listed by number and by percentages. As one might expect, the greatest losses are from the lower ranking groups.

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1930	3	5	3	6	3	5	5	4	1	0	0	35
1931	4	8	4	4	5	3	2	2	0	1	0	33
1932	1	7	8	5	4	3	1	3	1	0	0	33
1933	1	3	7	3	11	4	2	3	3	0	0	37
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The University, however, tries all possible means to correct or alleviate any such stigma that might come upon the lives of these young men and women. This is not an easy thing to do in many cases.

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Decile	1926			1927			1928			1929			1930			1931		
	T	G	L	T	G	L	T	G	L	T	G	L	T	G	L	T	G	L
1- 10	4	3	1	2	0	2	8	3	5	5	0	5	3	0	3	4	1	3
11- 20	6	1	5	5	1	4	6	1	5	7	2	5	5	1	4	8	3	5
21- 30	15	6	9	7	0	7	10	3	5	4	3	1	3	1	2	4	0	4
31- 40	8	7	1	12	6	6	9	5	4	6	4	2	6	1	5	4	3	1
41- 50	6	1	5	8	3	5	9	8	1	3	1	2	3	0	3	5	2	3
51- 60	4	2	2	5	4	1	2	1	1	2	1	1	5	4	1	3	2	1
61- 70	9	5	4	3	2	1	3	1	2	3	3	0	5	2	3	2	1	1
71- 80	3	2	1	1	0	1	3	2	1	4	2	2	4	4	0	2	2	0
81- 90	1	1	0	3	1	2	1	1	0	0	0	0	1	1	0	0	0	0
91-100	0	0	0	2	1	1	1	1	0	0	0	0	0	0	0	1	1	0
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These facts are shown in Table III following, where the 258 students entering pharmacy from 1926 to 1931, inclusive, are listed by number and by percentages. As one might expect, the greatest losses are from the lower ranking groups.



TABLE III

	Decile Groups	Students per Group	Number	Lost Percentages	Number	Graduated Percentages
1	1- 10	26	21	70 08	7	29 92
2	11- 20	37	28	75 68	9	24 32
3	21- 30	43	30	69 77	13	30 23
4	31- 40	45	19	42 33	26	57 77
5	41- 50	34	19	55 89	15	44 11
6	51- 60	21	7	33 34	14	66 66
7	61- 70	25	9	44 00	14	56 00
8	71- 80	17	5	29 42	12	70 58
9	81- 90	6	2	33 34	4	66 66
10	91-100	4	1	25 00	3	75 00

We are not drawing conclusions from the study of these tables but the data present very serious educational and professional problems. First of all, there must be some reason or explanation for so many students dropping by the wayside before graduation time. We can explain this on the basis of the student's ability and various other factors that influence the lives of these young people, who come to us from homes over the state and country to enter into the life of the university and the college experience, but such explanations are inadequate. Some of them undoubtedly have backgrounds quite inadequate for such experiences as the college offers them, but this would not apply to all who fell by the wayside.

We are perhaps doing a very bad job of selecting the students who come to us. It would seem that we should know our students before they enter the University. From a knowledge of their experience, training and ability, we should be allowed to decide whether they are fully and thoroughly equipped to carry on the work expected of them in the School of Pharmacy and in other courses of the University.

As teachers of pharmacy we have a threefold obligation, namely, to the student, the state and the profession. We might fulfil these more efficiently and better by spending more time in selecting our students than in trying to salvage them.

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#### TENTATIVE PROGRAM THIRTY-SEVENTH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY AUGUST 24-25 1936

##### OFFICERS

*President* Robert C Wilson *Vice President* Homer C Washburn *Secretary Treasurer*  
Zada M Cooper *Chairman of the Executive Committee*, Charles B Jordan

##### MONDAY AUGUST 24TH

9 00 A M Meeting of the Executive Committee  
9 30 A M Meeting of Teachers' Conference

##### CONFERENCE OF TEACHERS OF PHARMACY, AUGUST 24TH 9 30 A M

*Chairman* Emery T Motley *Vice Chairman* Robert C Wilson *Secretary* Charles O Lee

##### CONFERENCE OF TEACHERS OF CHEMISTRY, AUGUST 24TH 9 30 A M

*Chairman* Arthur H Uhl *Secretary* Lewis C Britt

##### CONFERENCE OF TEACHERS OF PHARMACOLOGY AND PHARMACOLOGY AUGUST 24 1936

*Chairman* Charles E F Mollett *Secretary* Ralph D Bienfang

## CONFERENCE OF TEACHERS OF PHARMACEUTICAL ECONOMICS, AUGUST 24, 1936

*Chairman*, John F McCloskey, *Secretary*, W Henry Rivard

## SESSIONS OF THE ASSOCIATION

## FIRST SESSION, MONDAY, AUGUST 24TH, 1 30 P M

## Roll Call

Appointment of Committee on Resolutions

Address of the President, Robert C Wilson

Report of Secretary-Treasurer, Zada M Cooper

Report of Executive Committee, Charles B Jordan

Appointment of Nominating and Auditing Committees

Reports of Standing Committees

Committee on Educational and Membership Standards, A G DuMez

Committee on Curriculum and Teaching Methods, L Wait Rising

Committee on Activities of Students and Alumni, Edward J Ireland

Delegates to the American Council on Education, Rufus A Lyman

Monday, August 24th, Annual Dinner, 6 00 P M

## SECOND SESSION, MONDAY AUGUST 24TH, 8 00 P M

Reports of Standing Committees (*Continued*)

Committee on Relation of Boards and Colleges C Leonard O'Connell

Committee on Libraries, Charles O Lee

Committee on Problems and Plans Rufus A Lyman

Syllabus Committee, J G Beard

## Reports of Special Committees

Committee on Student Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION, William G Crockett

Committee on the Establishment of a Pharmaceutical Corps in the United States Army  
Edward Spease

Committee on Food and Drug Legislation, Charles B Jordan

Committee on Pharmacy Aptitude Tests, Carl J Klemme

## JOINT SESSION OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY AND THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY, TUESDAY, AUGUST 25 1936, 9 00 A M

## Report of the Fairchild Scholarship Committee E G Eberle

## THIRD SESSION, TUESDAY, AUGUST 25TH, 2 00 P M

Reports of Special Committees (*Continued*)

Committee on Professional Relations, George C Schicks

Committee on the Study of Examinations C Leonard O'Connell

## Reports of Special Representatives

Representative on American Council on Pharmaceutical Education A G DuMez

Reporter on Biological Abstracts Heber W Youngken

Representatives to National Council on Pharmaceutical Research Glenn L Jenkins

Representatives to Druggists' Research Bureau, Paul C Olsen

Representative to the National Association of Retail Druggists, Clair A Dye

Report of the Historian, Edward Kremmers

Unfinished Business, Miscellaneous, Election of Officers, New Business, Executive Session

## TENTATIVE PROGRAM, NATIONAL ASSOCIATION BOARDS OF PHARMACY

## FIRST SESSION MONDAY, AUGUST 24TH, 9 30 A M

1 Call to Order, President Mac Childs

2 Roll Call

3 Appointment of Committee on Credentials, President Mac Childs

- 4 President's Address Mac Childs
- 5 Appointment Committee on President's Address
- 6 Report of Secretary H C Christensen
- 7 Report of Treasurer J W Gayle
- 8 Appointment of Nominating Committee President Childs
- 9 Report of Executive Committee Clare Allan *Chairman*
- 10 Presentation of Suggested Amendments to Constitution and By Laws, Walter Varnum

SECOND SESSION, MONDAY, AUGUST 24TH 1 30 P M

- 1 Report of Advisory Examination Committee, H C Christensen, *Chairman*
- 2 Report of Syllabus Committee
- 3 Report of Legislation Committee G A Moulton *Chairman*
- 4 Report of Committee on National Legislation Robert L Swain, *Chairman*
- 5 Report of Committee on Prerequisite Legislation C W King, *Chairman*
- 6 Report of Publicity Committee, Hugh P Berne, *Chairman*
- 7 Report of Grievance Committee M N Ford *Chairman*
- 8 Report of Committee on National Certificate H C Christensen *Chairman*
- 9 Report of Committee on Minimum Standards of Technical Equipment, A C Taylor, *Chairman*
- 10 Report of Committee on Pharmaceutical Jurisprudence Roy B Cook *Chairman*
- 11 Report of Committee on Code Matters Robert L Swain, *Chairman*
- 12 Report of Banquet Committee, Walter H Cousins *Chairman*

N A B P Banquet Monday August 24th 6 30 P M

JOINT SESSION WITH AMERICAN ASSOCIATION COLLEGES OF PHARMACY, TUESDAY AUGUST 25TH  
9 00 A M

FINAL SESSION TUESDAY AUGUST 25TH 1 30 P M

- 1 Reports of Vice Presidents
  - District No 1 V-P George A Moulton
  - District No 2 V P J M Woodside
  - District No 4 V P Earl Durham
  - District No 6 V P Emmett Weaver
  - District No 7 V-P R C Shultz
- 2 Report of Committee on President's Address
- 3 Report of Department of Education R L Swain, *Director*
- 4 Report of Committee on Constitution and By Laws, Walter Varnum *Chairman*
- 5 Report of Resolutions Committee A C Taylor *Chairman*
- 6 Reports of Special Committees
- 7 Unfinished Business
- 8 New Business
- 9 Report of Nominating Committee
- 10 Election and Installation of Officers
- 11 Adjournment

PROGRAM OF NATIONAL CONFERENCE ON PHARMACEUTICAL RESEARCH 1936  
MEETING DALLAS TEXAS AUGUST 22 HOTEL ADOLPHUS

FIRST SESSION 2 00 P M

- 1 Call to Order by Chairman
- 2 Appointment of Nominating Committee
- 3 Summary of Year's Activities and Outlook of Conference for the Future by Chairman Gathercoal
- 4 Reports of Officers
  - a Report of Secretary

- b* Report of Treasurer
  - c* Report of Executive Committee by Secretary
  - 5 Reports of Standing Committees
    - (1) Physical Chemistry Arthur Osol *Chairman*
    - (2) Bacteriology and Immunology, Louis Gershenfeld *Chairman*
    - (3) Pharmacognosy Heber W. Youngken *Chairman*
    - (4) Pharmacology and Bioassays, James C. Munch *Chairman*
  - 6 Roll Call of Delegates
  - 7 Adjournment for Dinner Arrangements Will Be Made for a Dinner for the Delegates Assembled
- An address pertinent to the work of the Conference will be delivered

## EVENING SESSION 8 00 P M

- 8 (5) Medicinal Chemicals, Joseph Rosin *Chairman*
- (6) Endocrinology, Arthur Grollman, *Chairman*
- (7) Manufacturing Pharmacy, L. Wait Rising *Chairman*
- (8) Pharmaceutical Dispensing, William J. Husa *Chairman*
- (9) Educational Methods A. B. Lemon *Chairman*
- (10) Pharmaceutical Economics Harry S. Noel *Chairman*
- (11) Historical Pharmacy Charles H. LaWall, *Chairman*
- 9 Reports of Other Special Committees
  - (1) Publications, Edward N. Gathercoal, *Chairman*
  - (2) Census of Research James C. Munch, *Chairman*
- 10 General Discussion of the Status of Pharmaceutical Research
- 11 Election and Installation of Officers
- 12 Adjournment

*Chairman, E. N. Gathercoal, Secretary John C. Krantz Jr*

## CORRECTIONS IN THE U S P XI

Since the appearance of the new Pharmacopœia in December of 1935 the text has been subjected to intensive review and some corrections have been found necessary. In so far as these cover typographical errors or accidental inaccuracies, authority has been given to publish the list of corrections in pharmaceutical and medical journals.

Purchasers of the new Pharmacopœia may also obtain a printed list of these corrections for insertion in their copies of the U S P. Send a 3 cent stamp to the publishers of the Pharmacopœia, the Mack Printing Company, Easton, Pa.

Questions have also arisen concerning certain Pharmacopœial assays or tests and these are under investigation. In those cases where it becomes desirable to revise any of the printed monographs such changes will be announced by "Interim Revision" procedure.

## NATURAL WATER VERSUS DISTILLED WATER IN DRUG EXTRACTION ETC

The new Pharmacopœia directs that distilled water shall be used in all formulas, but a further study of the difficulties involved has led the Committee to revise this requirement and permit the use of a *natural water* of good quality as an alternative to distilled water in the extraction of U S P vegetable drugs and in the manufacture of Resin of Podophyllum and of Saponated Solution of Cresol. This is of the nature of an "interim revision" and a formal statement permitting the alternative use of natural water and establishing standards for it will be issued in the near future as an Interim Revision.

In addition to this revision of the distilled water requirement, other interim revision changes will soon be announced.

E. FULLERTON COOK, *Chairman*

*Corrections in N F VI will be found at end of Council Letter No. 21 this issue of the JOURNAL*

## CORRECTIONS IN THE UNITED STATES PHARMACOPŒIA, ELEVENTH REVISION \*

To be made in copies numbers 100 001 to 150,000

Page	Lines	
IXA		Under 'Hydrastis' and the sub head "Pulvis Hydrastidis" <i>change</i> Hydrastis" to Hydrastine"
LXIV		<i>Change</i> Theophyllina cum Sodii Acetas' to "Theophyllina cum Sodii Acetate "
19	4-6	<i>Change to</i> ' Mix 0.5 Gm of powdered Citric Acid with 5 cc of sulfuric acid in a test tube that has been previously rinsed with sulfuric acid and maintain the temperature of the mixture at 90° C for one hour the color of the mixture is not darker than matching fluid K described under the test for <i>carbonizable substances</i> , page 441 "
32	1-3	<i>Change to</i> The potency of Aconite shall be such that 0.1 Gm of it, when extracted and assayed as directed under <i>Tinctura Aconiti</i> page 391, shall possess an activity equivalent to not less than 0.150 milligram of reference aconitine ' Fifth line from bottom of page <i>Change</i> 14.3 to 15.8
78	1-4	<i>Change to</i> The solution produced by dissolving 0.2 Gm of Atropine Sulfate in 5 cc of sulfuric acid has no more color than matching fluid A described under the test for <i>carbonizable substances</i> page 441 and the solution becomes only light yellow upon the addition of 0.2 cc of nitric acid ( <i>many other alkaloids</i> ) '
96	33-46	<i>Change to</i> <i>Assay</i> Weigh accurately in a glass stoppered weighing tube about 0.4 Gm of Calcium Bromide dissolve it in 100 cc of distilled water and add 1 cc of hydrochloric acid Heat the solution to boiling and add with stirring an excess of hot ammonium oxalate T S then make slightly alkaline with ammonia T S Heat the mixture on the water bath for two hours filter through hardened filter paper and wash thoroughly with warm distilled water Puncture the filter paper wash the precipitate into a beaker by means of a stream of hot distilled water followed by 30 cc of dilute sulfuric acid (1 in 3) heat the solution if necessary to 60° C and titrate with tenth normal potassium permanganate Each cc of tenth normal potassium permanganate is equivalent to 0.009996 Gm of CaBr "
97	43	<i>Change</i> 0.05004 Gm to 0.005004 Gm
103	18	<i>Change to</i> The specific rotation $[\alpha]_D$ of Natural Camphor determined at 25° C in a solution containing 10 Gm of Camphor in sufficient alcohol to make 100 cc and using a 200 mm tube, is between +41° and +42° page 459 ' Omit all reference to the specific rotation of Synthetic Camphor
118	12	<i>Change</i> 0.5 Gm to 0.2 Gm
125		Third line from bottom of page <i>Change</i> 0.5 Gm to 0.01 Gm
126	10	<i>Change</i> 433.25 to 424.24
127	32	<i>Change</i> 0.45' to 0.45
135	21-22	<i>Add</i> between the lines

NOTE In preparing aqueous solutions of Dextrose it is permissible to use a dextrose which does not conform to the official requirements for

\* A copy of this list may be obtained by a purchaser of the U. S. P. XI by sending a 3 cent stamp to cover postage expense to the publishers of the Pharmacopœia the Mack Printing Company Easton Pa.

water of hydration, provided the product meets all other official tests for purity and also provided suitable allowance is made for the difference in water content "

- 139 17 *Change 0.5 Gm to 0.1 Gm*  
 150 12 *Change 0.3 Gm to 0.03 Gm*  
 150 12 *Change 5 grains to 1/ grain*

- 180 11-14 *Change to*

"Vigorously shake 5 cc of Glycerin with 5 cc of sulfuric acid in a glass stoppered 25 cc cylinder for one minute and allow the liquid to stand for one hour, it does not become darker than 10 cc of matching fluid H described under the test for *carbonizable substances* page 441 "

- 195 Fourth line from bottom of page *Change 62 to 63*

- 195 Fifth line from bottom of page *Change 61 to 60*

- 196 29-30 *Change 'continue the heating' to 'maintain the crucibles and mass at dull redness'*

- 208 33 *Add the synonym "Vioosterol in Oil"*

- 208 44 *Delete "Unsaponifiable matter not more than 2 per cent page 446*

- 231 *Fourth line from bottom of page, delete 'natural'*

- 231 Fifth line from bottom of page, *change 42° and 44° C to 41° and 43° C*

- 235 Fourth line from bottom of page, *change 0.2 Gm to 0.12 Gm*

- 278 21 *Insert before 'Add'*

"Place 100 cc of distilled water in a 300-cc Erlenmeyer flask, add 5 cc of Paraldehyde and shake the mixture gently until solution is complete "

- 289 Sixth line from bottom of page *change 0.5 Gm to 0.1 Gm*

- 290 Twelfth line from bottom of page *change 0.5 Gm to 0.1 Gm*

- 313 6 *Change 0.5 Gm to 0.2 Gm*

- 313 Last line at bottom of page *change 0.5 Gm to 0.2 Gm*

- 315 27 *Change 0.5 Gm to 0.2 Gm*

- 316 14 *Change 0.5 Gm to 0.2 Gm*

- 317 17 *Change 0.5 Gm to 0.2 Gm*

- 318 22 *Change 0.5 Gm to 0.2 Gm*

- 319 8 *Insert after "444" "using about 1 Gm of the Rosin accurately weighed"*

- 321 5 *Delete "or" and insert after "species" (except *Rheum rhabonticum*) or of '*

- 322 22 *Change 0.5 Gm to 0.2 Gm*

- 324 Line 10 from bottom of page *change 0.5 Gm to 0.1 Gm*

- 353 30 *Change 25 cc to 5 cc*

- 353 39 *Change 25 cc to 5 cc*

- 362 Ninth line from bottom of page *change 0.5 Gm to 0.1 Gm*

- 363 30 *Change 0.5 Gm to 0.2 Gm*

- 368 31 *Change 7.243 to 7.281*

- 377 *Insert between the third and fourth line from bottom of page Alcohol content—From 1 to 2 per cent by volume of C<sub>2</sub>H<sub>5</sub>OH '*

- 378 27 *Change 7.5 to 8.5 to 8.5 to 11*

- 383 5 *Change 0.5 Gm to 0.2 Gm*

- 384 20 *Change 0.5 Gm to 0.2 Gm*

- 384 33 *Change 70 to 75*

- 384 34 *Change 80 to 85*

- 391 25-32 *Change the directions to*

'Prepare a tincture by Process P as modified for assayed tinctures page 390 using a mixture of 3 volumes of alcohol and 1 volume of distilled water as the menstruum Macerate the drug during twenty-four hours and then percolate it at a moderate rate Immediately add sufficient hydrochloric acid to this percolate to produce a  $p_H$  of 3  $\pm$  0.2 page 576 Assay

## CORRECTIONS IN THE UNITED STATES PHARMACOPŒIA ELEVENTH REVISION \*

To be made in copies numbers 100 001 to 150 000

Page	Lines	
lxx		Under Hydrastis" and the sub head Pulvis Hydrastidis change 'Hydrastis' to Hydrastine
lxxiv		Change 'Theophyllina cum Sodii Acetas' to 'Theophyllina cum Sodii Acetate'
19	4-6	Change to Mix 0.5 Gm. of powdered Citric Acid with 5 cc. of sulfuric acid in a test tube that has been previously rinsed with sulfuric acid and maintain the temperature of the mixture at 90° C. for one hour. The color of the mixture is not darker than matching fluid K described under the test for carbonizable substances page 441
32	1-3	Change to The potency of Aconite shall be such that 0.1 Gm. of it when extracted and assayed as directed under <i>Tritura Icoris</i> page 391 shall possess an activity equivalent to not less than 0.150 milligram of reference aconitine. Fifth line from bottom of page Change 14.3 to 15.8
78	1-4	Change to The solution produced by dissolving 0.2 Gm. of Atropine Sulfate in 5 cc. of sulfuric acid has no more color than matching fluid A described under the test for carbonizable substances page 441 and the solution becomes only light yellow upon the addition of 0.2 cc. of nitric acid (many other alkaloids)
96	33-46	Change to Assay Weigh accurately in a glass stoppered weighing tube about 0.4 Gm. of Calcium Bromide dissolve it in 100 cc. of distilled water and add 1 cc. of hydrochloric acid. Heat the solution to boiling and add with stirring an excess of hot ammonium oxalate T.S. then make slightly alkaline with ammonia T.S. Heat the mixture on the water bath for two hours filter through hardened filter paper and wash thoroughly with warm distilled water. Puncture the filter paper wash the precipitate into a beaker by means of a stream of hot distilled water followed by 30 cc. of dilute sulfuric acid (1 in 3) heat the solution if necessary to 60° C. and titrate with tenth normal potassium permanganate. Each cc. of tenth normal potassium permanganate is equivalent to 0.009996 Gm. of CaBr
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a portion of the percolate and adjust the volume of the remaining liquid by dilution with the above menstruum, including sufficient hydrochloric acid to produce a  $pH$  of  $3 \pm 0.2$  page 576, so that the finished Tincture will conform to the above biological standard "

399		<i>Insert between the tenth and eleventh lines from the bottom of page</i> <i>Alcohol content</i> —From 58 to 64 per cent, by volume of $C_2H_5OH$ "
488	28	<i>Change</i> 0 1631 Gm to 0 1814 Gm
572	25	<i>Change</i> 0 02041 to 0 2041
592	14	<i>Change</i> 433 25 to 424 24

## SUGGESTED MOUTH WASH PRESCRIPTIONS FOR USE IN DENTAL PRACTICE \*

The Committee desires to exchange publicity material distributed to the medical profession

$\mathcal{R}$

	Apoth Metric
Liq Antisept N F	f3 viii 240 cc
Sig Dilute with equal parts of water as a mouth wash	

NOTE This same preparation may be prescribed by writing the official Latin title—*Liquor Antisepticus N F* or the official English title—*N F Antiseptic Solution*

Another way of writing the same prescription

$\mathcal{R}$

Liq Antisept N F	f3 iv 120 cc
Aq Dest	qs f3 viii 240 cc
M	
Sig Use undiluted as a mouth wash	

NOTE To color the above prescription red add

Liq Amarant N F	m \ 0.6 cc
-----------------	------------

$\mathcal{R}$

Liq Arom Alk	f3 viii 240 cc
Sig Use undiluted as a mouth wash	

NOTE For use in dental spray bottle dilute with 5 volumes of water

Official Latin title—*Liquor Aromaticus Alkalinus* Official English title—*Alkaline Aromatic Solution*

This preparation is red in color

$\mathcal{R}$

	Apoth Metric
Liq Iod Phenol	f3 viii 240 cc
Sig Dilute with equal parts of water as a mouth wash	

NOTE This same preparation may be prescribed by writing the official Latin title—

*Liquor Iod Phenolatus* or the official English Title—*Phenolated Solution of Iodine*, or the official synonyms—*Boulton's Solution* *French Mixture* or *Carbolized Solution of Iodine*

Another way of writing the same prescription

$\mathcal{R}$

Liq Iod Phenol	
Aq Dest	aa f3 iv 120 cc
M	
Sig Use undiluted with water	

$\mathcal{R}$

Liq Sod Bor Co	f3 viii 240 cc
Sig Use as a mouth wash	

NOTE The official Latin title for this preparation is—*Liquor Sodii Boratis Compositus* Official English title—*Compound Solution of Sodium Borate* official synonym—*Dobell's Solution* (To be continued)

\* U S P - N F Publicity Committees of the Maryland State Dental Association Maryland Pharmaceutical Association and Baltimore Retail Druggists Association

## TEXAS WILD FLOWERS

This profusion of wild flowers on Texas roadsides is not accidental. It results from planned efforts of the State Highway Department in roadside improvement. In all parts of the State highway maintenance men mow flowers that have gone to seed. They cut not only along the roads but also—with the owners' permission—in farmers' fields in which desirable wild flowers are abundant.

# PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council"

—Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association"

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates"

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter *Please advise us of changes in Roster and mail reports promptly*

## CHICAGO

The monthly meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening April 21st This was the last meeting of the Branch until the beginning of school in the Fall Over one hundred members and their friends were present at the meeting which ended a very successful term of monthly meetings from the standpoint of speakers presented and attendance

President Morrison opened the meeting with a brief summary of the activities of the Branch during the past school year

Secretary Templeton presented a short financial report which showed the Branch in a very favorable financial condition as compared with recent years Nineteen new members have been secured since September 1935

Mention was made of the Convention to be held at Dallas Texas, August 24th-29th and that many members from the Chicago territory are planning to attend

President Morrison introduced the speaker of the evening Dr Hutton past president of the Chicago Medical Society and eminent physician Dr Hutton spoke on the subject of "Practical Endocrinology"

Dr Hutton listed the hormones of the Anterior Pituitary as growth hormone, sex hormone, adrenotropic, thyrotropic, parathyrotropic, lactogenic and diabetogenic The parathyrotropic hormone has been discussed but not agreed upon as to actual existence The diabetogenic hormone has to do with fat and carbohydrate metabolism

For a long time physicians have known that mothers afflicted with pituitary deficiency have been unable to nurse their babies and with present knowledge this is attributed to a deficiency of the lactogenic hormone

In many cases where the sex hormone is over functioning the growth hormone is found to be in deficiency and vice versa

Names of some of the preparations of the anterior lobe of the pituitary gland were mentioned as Thyrotropic, Adrenotropic, Prolactin, Polyansyn and Antuitrin

Slides were shown depicting pituitary deficiency and incidentally, it was mentioned by Dr Hutton that measles is sometimes followed by a lack of pituitary secretion

Preparations of the growth hormone of the pituitary were mentioned as Antuitrin G and Phylene The sex hormone (also known as maturity or gonadotropic hormone) preparations were listed as Antuitrin S, Follutein, A. P. L., and Prephysin The Antuitrin S and Follutein are obtained from pregnancy urine

Sources of the gonadotropic principles are Anterior lobe of the pituitary gland, pregnancy urine and blood, menopause urine, castrate urine and placenta

The gonadotropic principles are effective only where the ovaries are present while the estrogenic principles are effective when the gonads are absent

Posterior Lobe preparations mentioned were Pitressin, Pitocin and Pituitrin Slides were shown of the effect of malfunction of the fat metabolism hormone present in the posterior lobe

Estrogenic preparations mentioned were Amniotin, Theelin, Theelol, Progynon Sistomen sin, Agomensin, Progestin, Emmenin Ovarian Substance and Ovarian Residue

The ovary owes its impetus to growth to the anterior pituitary and later the ovary exerts an inhibitory action on the pituitary Many times there is too fine a discrimination for the clinician, so then the whole gland should be used These glandular disturbances are hereditary or caused by disease and there is need for long and thorough treatment with an understanding by the patient that results probably will not be immediate or may be negative

Persons with pituitary disturbances are prone to severe headaches and this symptom is a guide in many cases to the physician

The testicular hormone has been investigated and there is a question as to whether one or two hormones exist Preparations of the testicular hormone were mentioned as Androsterone (from the testicle) Androsterone (synthetic), Testosterone Androstine and Stanley's Material

Tumors of the pineal gland give rise to excessive genital growth

Hypertension and Diabetes are sometimes relieved by small doses of X ray to the pituitary and adrenal glands

Dr Hutton ran a constant series of slides throughout his lecture that were very informative and gave a clear picture of the physical deformities caused by malfunction of the gland under discussion

Questions were asked by members of the group and the meeting was closed by a standing expression of thanks to Dr Hutton for his very clear discussion

L TEMPLETON, *Secretary*

## NEW YORK

The regular meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on Monday evening, April 13, 1936 at Columbia University College of Pharmacy

The meeting was called to order at 8 30 P M President Schaefer presiding The minutes of the March meeting were read and approved

Chairman Hauck of the Committee on Membership submitted the application for membership in the Branch of Raymond F James, he was elected to membership

Chairman Lehman of the Committee on Education and Legislation reported as follows

*Federal Legislations*—Robinson Patman Bill H R 8442 with amendments was reported to the House Judiciary Committee on March 31st The amendment provides that 'nothing in this bill shall prevent a cooperative association from returning to its members or a cooperative wholesale association from returning to its constituent retailer members—net earnings in proportion to their sales to, from and through such associations'

It is expected that the Copeland Bill S 5 will be reported to the House Interstate & Foreign Commerce Committee This is the new law to control the Food Drug and Cosmetic industry, and is to supplant the present Pure Food and Drugs Act It is hoped that its passage may be insured

The Doughton Act H R 11452, placing the control of the Secret Service Division, a Liquor Enforcement Section, a Counterfeiting Section a Customs Section, a Section on Personnel and a Section on Narcotics, is now lying dormant, but renewed efforts are being made to secure its enactment in spite of the opposition to the measure from influential sources A joint committee composed of the representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION the Federal Wholesale Druggists Association the American Drug Manufacturers Association and Admiral R P Hobson of the World Narcotic Educational Association are drafting an amendment perpetuating the Bureau of Narcotics as a separate establishment of the Treasury Department

*State Legislation*—Twomey-Averill Bill To amend the education law in relation to the definition of Chemist used in Article 51, has been reported out favorably

Twomey Averill bill to amend the education law in relation to the revocation of license to practice pharmacy has been reported out favorably

Dunckel Milmoie bill which forbids the sale at wholesale of Poisonous, Habit forming or Deleterious drugs to unlicensed dealers has been killed in committee

Twomey-Piper bill designed to limit the opening of new pharmacies and drug stores, has been killed in committee

Senate 849, print 930, Feld, Assembly 1408 print 1567, Piper This is a stop-loss provision measure, which forbids the sale of any drug store merchandise at a price below the manufacturer's list price per dozen, and its enforcement is confined to the retail drug business entirely This bill has been favorably reported out of committee and seems to have a good prospect of being passed

The Livingston New York State Distributive Trades Commission Act, Senate 1355 print 1578, is being well received in many groups, provides for a formation of a commission similar to the Federal Trade Commission, which will have control of the distribution of merchandise and which is to prevent unfair competition, etc This provides for commissioners and a bureau the funds for the support of which will be provided by taxation proportionately to the income of each establishment Efforts are being made to put this law through but it may have to lay over till next session

Mr Schaefer reporting as a delegate to the New York Pharmaceutical Council said that the election of officers would take place on the first day of the N Y All City Fair Trade Convention and that it was necessary to increase the number of delegates to the full number permitted He therefore, announced that he had appointed the following as delegates

<i>Delegates</i>	F C A Schaefer	<i>Alternates</i>	John J Corcoran
	Samuel C Henry		George Christ
	Jacob Seley		Milton S Malakoff
	H H Blomeier		Dr F A Leshe
	Chas Heimerzheim		George Decker
	Dr Geo C Diekman		

and requested the approval of the Branch for his action

Dr Hugo Schaefer moved that the action of the president be endorsed Motion seconded by Dr Wimmer, carried

Dr Wimmer moved that the Branch instruct the delegates to cast their vote in support of the ticket presented in the report of the nominating committee This was seconded by Mr Lehman, and carried

The secretary was instructed to write to the delegates and inform them of their instructions Secretary Schaefer, of the Remington Medal Committee reported that Dr Edmund N Gathercoal will be the recipient of the Honor medal for 1936 He moved that the secretary write Dr Gathercoal, congratulating him upon the honor and asking his pleasure with regard to the presentation Dr Wimmer seconded and the motion was carried

As delegate to the House of Delegates, Dr Schaefer stated that as it was customary for the convention of the AMERICAN PHARMACEUTICAL ASSOCIATION to go to a different section of the country each year, it should return to the East in 1937 He suggested that a committee be appointed to study the question as to whether or not it would be feasible to invite the convention to come to New York at that time Dr Wimmer moved that Dr Schaefer be appointed to act for the Branch Motion was seconded and carried

Chairman Steiger, of the Committee on the Progress of Pharmacy, reported as follows

"A patent assigned to Chemische Fabrik Sandoz describes the separation of Ergot alkaloids by chromatographic absorption according to the method of Tawett The crude extracts of the alkaloids are dissolved in indifferent solvents such as benzene or its homologs, and the solutions are passed into a column containing absorbents insoluble in the solvents used, e g, sugar lime, etc By diffusion of the solution in the absorbent column there appears a chromatogram visible to ultraviolet light Examples are given of the separation of ergotamine and ergotamine, ergotoxin and ergotinine (*C A*, Vol 30, No 6) "

The *Chemist & Druggist* (London 2/15/36) comments on an article on "Oral Vaccine for Colds" in *The British Medical Journal* Five strains of Pfeiffer's bacillus along with a strain of *A bronchitica* are grown together in bacterial symbiosis, in blood agar broth flasks for seven days The culture is killed with 1% phenol over night It is then diluted with an equal amount of sterile saline so as to reduce the phenol content to 1/2% and tested for sterility By a process of trial and error the optimal dose was determined The results obtained since September are

distinctly encouraging, indicating that specific agglutins to Pfeiffer's bacillus are formed and that antitoxins appear in the blood after oral administration of the broth culture described

*Drug Trade News* (3/16/36) tells of a patent assigned to Winthrop Chemical Co for Vitamin D solutions in glycols These higher glycol derivatives permit Vitamin D to be administered to infants in water-soluble form

President Schaefer called for a discussion on ways to increase attendance at regular meetings After considerable discussion it was moved that a committee be appointed to investigate the subject The motion was seconded and carried

President Schaefer then introduced the guest speaker, Prof George C Schicks who addressed the Branch on the subject of 'The Challenge of Dentistry to Scientific Pharmacy'

The speaker stated that a real challenge existed in the relations between dentists and pharmacists The dentists are an enthusiastic group with which to work They are willing to listen and to learn what the pharmacist has to teach The dentist does not know of the U S P and N F preparations which he can obtain from the pharmacist and it is the pharmacist's job to give him the information The dentist, perhaps without even knowing it, needs the professional services of the pharmacist

If the pharmacists will prepare correctly the official preparation which may be used by the dentist and will detail the dentist with these preparations they will be amply rewarded for their trouble The dentist will pay good prices for what he gets He is used to it

The speaker distributed a pamphlet of Dental Prescriptions for Office and Patient's Use This contained a number of official and unofficial preparations of proved value

After considerable discussion, a rising vote of thanks was accorded the speaker and the meeting adjourned

HORACE T F GIVENS *Secretary*

## PHILADELPHIA

The April meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION was called to order at 8 15 P M April 15th at the Philadelphia College of Pharmacy and Science by President Lawrence L Miller

The minutes of the March meeting were read and approved

Dr James C Munch of the membership committee presented the following applications for membership in the local branch Martin Ulan, Wilton Kimmer Albert Chiola Nathan Zonies, Dr Thomas M Logan Prof Neal Bowman The applicants were duly elected to membership and the secretary was instructed to place their names on the official files upon presentation of the usual fee of one dollar

President Miller announced the following committees to serve for the year 1936-1937

*Program Chairman* James C Munch Frank H Eby, E H MacLaughlin Alfred Barol H Evert Kendig

*Membership Chairman* S H Kerlin, Frank Law James C Munch, E H MacLaughlin N A Simpson Harry M Mantz Elwood S Paisley

*Professional Relations Chairman* W A Pearson H Evert Kendig Wilmer Krusen

*Entertainment Chairman* Adley B Nichols Marin S Dunn Arthur K Leberknight

*Practical Pharmacy Chairman* Ambrose Hunsberger E T Hahn, Theodore Campbell Jr

It was a pleasure to have two guest speakers on this occasion J Leon Lascoff *First Vice President* (elect) of the AMERICAN PHARMACEUTICAL ASSOCIATION member of the New York Board of Pharmacy and an outstanding retail pharmacist spoke on 'Problems in Pharmacy and How to Solve Them' J B Pilchard Secretary of the Pennsylvania Pharmaceutical Association, and an ardent worker in pharmaceutical circles spoke on 'Looking Ahead in Pharmacy'

These eminent speakers made this meeting one of the outstanding meetings of the Branch Dr Lascoff tabulated and spoke on nine of the major problems that face the retail pharmacist These problems were well planned and thoroughly discussed and analyzed Dr Lascoff presented some twenty prescriptions that frequently trouble the compounding pharmacist He spoke on and illustrated the right and the wrong way to compound these prescriptions The members of the Branch were pleased with the masterful way in which Dr Lascoff handled these difficult incompatibilities Many questions were asked by the membership

Secretary Pilchard emphasized and evaluated the need of organization in the profession

The local branch is in accord with Mr Pilchard's remark that "complete organization is one method of solving many of our problems" As he stated, Our aim is to get those pharmacists who do not attend to attend, for we who do attend already realize the need, hence we are here" Mr Pilchard spoke of the value of the pharmacist and the Pennsylvania Pharmaceutical Association in those sections of Pennsylvania which were inundated during the floods

A rising vote of thanks was given the speakers for their excellent presentations

GEORGE E BYERS *Secretary*

#### MAY

The May meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION was held at Sharp and Dohme Laboratories Glen Olden Penna, Tuesday night May 12, 1936 The meeting was called to order by President L L Miller The reading of the minutes was dispensed with

The Branch was favored by two excellent speakers Dr J E Schneider of Sharp and Dohme presented a most learned dissertation on "Rabies" Dr Thomas S Githens, also of Sharp and Dohme, presented the ever-popular 'Snakes and Antivenin'

Dr Schneider pointed out that if an individual was bitten by a dog, the animal should immediately be placed in quarantine, under competent supervisors, and the individual be given Rabies treatment at once If at the end of seven days the animal is found to be not rabid, he could be released and the person's treatments could be discontinued He stated that seasons had little to do with the prevalence of the infection He discussed in detail the preparation of Rabies Vaccine and its use This pertinent subject brought forth many interesting questions from the group

Dr Githens' subject, as always was well presented and again the interest and fascination in snakes was demonstrated by the variety of questions it called forth The audience was pleased with the demonstration of the value of Antivenin Dr Githens injected two pigeons, one with venom and the other with venom and antivenin, in a very short time the results were in evidence The movie on how snake venom is collected was well received Of unusual interest was the demonstration of 'The Black Widow' Spider The hearers were glad to learn that science has succeeded in securing therapeutic treatment against this deadly bite

A rising vote of thanks was given the speakers for their cooperation in making this meeting a success

Chairman Kerlin, of the Membership Committee presented the following applications for the Local Branch Robert Reubush, Paul B Robinson, Frederick Scholl

Applications for the Parent Body J W Jester, Sr, David Phillips

The applicants were elected to membership in the Local Branch

The business meeting was preceded by a dinner at Sharp and Dohme's This was attended by forty two guests

GEORGE E BYERS, *Secretary*

#### REPORT OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION ON THE NEW ERGOT ALKALOID

The Council of Pharmacy and Chemistry of the American Medical Association has made the following report on the new ergot alkaloid

During the past year, communications from four laboratories have been published reporting the isolation of a new oxytocic alkaloid from ergot Until recently there has been doubt as

to whether or not the principles reported by these laboratories were identical (termed 'Ergotocin' by Kharasch 'Ergometrine' by Dudley and Moir, 'Ergobasine' by Stoll and 'Ergostetrine' by Thompson) In a jointly signed statement (*Science* February 28th) Kharasch King (acting for Dudley), Stoll and Thompson say there is 'no doubt that the alkaloid obtained in the four different laboratories was the same substance' "*Science* March 27, 1936

# ASSOCIATION BUSINESS

## AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION 1935-1936

Office of the Secretary, 2215 Constitution Ave Washington D C

LETTER NO 19

April 25, 1936

*To the Members of the Council*

119 *Use of Text of N F VI* Motion No 52 (Council Letter No 18, page 366) has been carried and Dr Blayney has been so advised

P Blackiston's Son & Co, Inc Philadelphia, Pa, have requested permission to use the text of N F VI for partial reproduction in the following books Gould, "New Medical Dictionary," 4th Edition (Reprint), Gould, Pocket Pronouncing Medical Dictionary, ' 10th Edition (Reprint), Scoville "The Art of Compounding," 6th Edition, Youngken "A Textbook of Pharmacognosy," 4th Edition

Chairman DuMez of the Committee on Publications recommends that the request be granted under the usual conditions and at the usual fee of \$5 00 in each case

(*Motion No 55*) It is moved by DuMez that P Blackiston's Son & Co Inc be granted permission to use portions of the text of the N F VI in Gould "New Medical Dictionary," 4th Edition in Gould "Pocket Pronouncing Medical Dictionary" ' 10th Edition, in Scoville "The Art of Compounding" ' 6th Edition, and in Youngken "A Textbook of Pharmacognosy," 4th Edition with the customary acknowledgment and at the usual fee of \$5 00 in each case

The following letter has been received from Professor E Fullerton Cook (see Council Letters Nos 16 page 364 and 17 page 365)

In a letter dated December 24, 1935 I requested permission to use certain portions of the N F VI text in the forthcoming edition of Remington's Practice of Pharmacy Evidently this was granted as a bill was recently received covering the charge

'In further studying the situation it has been decided that it will be necessary to change the first plan and use the text very much as in the Seventh Edition In other words we find it possible at least in some instances to use chemical tests and assays and prefer to have permission to use the official wording rather than to rewrite it

'I would therefore respectfully request in the name of the Publishers, J B Lippincott Company permission to use such portions of the N F VI as may be desirable following the same style as was used for the Seventh Edition of the Remington ' \$1000 00 was charged for this privilege ten years ago "

Chairman DuMez of the Committee on Publications recommends that permission be granted under the conditions set forth in Professor Cook's letter

(*Motion No 56*) It is moved by DuMez that permission be granted to E Fullerton Cook for the J B Lippincott Co to use portions of the text of the N F VI in a new edition of Remington's Practice of Pharmacy" to the extent used in the Seventh Edition, with the usual acknowledgment and at the same charge of \$1000 00

120 *University of Mississippi Student Branch* Motion No 53 (Council Letter No 18, page 366) has been carried and the application and the Constitution of the Branch are approved

121 *Election of Members* Motion No 54 (Council Letter No 18 page 368) has been carried and applicants for membership numbered 260 to 285 inclusive, are declared elected

122 *Copyright of the N F VI* A certificate of copyright registration Entry Class A, No 93434, has been received from the Register of Copyrights, Library of Congress, Washington, D C

123 *Refunding Loan on Lot No 7* The following letter has been received from Dr H A B Dunning

' At the meeting of the A P H A in Rapid City in 1929 I submitted a recommendation to the Council that authorization be given to purchase Lots 12 13, 14 15 and 7 in Square 62 of Washington, D C , from the George Washington University under the conditions set out in the communication which will be found on pages 959 960 and 961 of the September 1929, A P H A JOURNAL

' Lots 12, 13, 14 and 15 were necessary to complete our property, but the George Washington University was not willing to sell us these lots unless we would also purchase Lot No 7 In view of the circumstances, the University agreed that if Lots 12, 13, 14 and 15 were paid for in cash, a mortgage note for \$36,400 00 would be accepted for Lot No 7 for five years, at 5 1/4 % interest payable semi annually, and this arrangement was approved by the Council

The George Washington University has recently requested that this mortgage note be paid off because they need the proceeds in their building campaign Arrangements have been made with the Maryland Trust Company, Baltimore, Maryland, for a loan of \$36,400 00 for three years at 4%, payable quarterly to pay the existing encumbrance

I am requesting that the Council now authorize the proper officers to borrow the sum of \$36,400 00 from the Maryland Trust Company for the purpose above stated and call attention to the fact that the proposed arrangement will mean a material reduction in the interest charge The deed of trust requires a mortgage on all the property and the building I can see no objection to this requirement, inasmuch as the mortgage could be readily liquidated, if necessary on account of the small sum involved "

Dr Dunning has had the terms of the deed of trust examined by his legal advisor who approves the terms, and Chairman Hilton of the Council approves the refunding arrangement as outlined

The District Title Insurance Company which company insured the title to the land owned by the ASSOCIATION will prepare and check the necessary papers

(*Motion No 57*) It is moved by Dunning that the Council of the A P H A does hereby authorize C W Holton, treasurer, and E F Kelly, secretary, of the ASSOCIATION for the purpose of paying the existing encumbrance on the property, to borrow the sum of \$36,400 00, said loan to be evidenced by a promissory note of this ASSOCIATION payable in three years with interest at 4%, payable quarterly, and to secure said note by executing a deed of trust in the usual form covering all of its land together with Building in Square 62 of the City of Washington and does constitute and appoint S L Hilton its attorney in fact to acknowledge said deed of trust on behalf of this ASSOCIATION

As the George Washington University requests the payment as promptly as possible a vote on this motion is called for It will be considered as tentative if there is objection or if any members of the Council desire additional information or to submit comment

124 *Applicants for Membership* The following applications, properly endorsed and accompanied with the first year's dues, have been received

No 286, Kelsey H Petro, 839 N Kansas Ave , Topeka, Kans , No 287 Frank Milne, Pratt, Kans , No 288, Joseph D McIntyre, Delaware Ave & Vine St , Philadelphia, Penn , No 289, Edith M Schofield, 26 S Ohio Ave , Atlantic City, N J , No 290, Paul J Thomas, Vet Admin Frac St Cloud, Minn No 291 Arthur P Wyss, 800 E Market St , Indianapolis Ind , No 292 Wheaton Bernard Smith, 661 Knower St , Toledo, Ohio, No 293 Walter H Varnum, 801 Mass St , Lawrence, Kans , No 294, George N Wilson, Mt Pleasant, Tenn No 295, Mary Imogene Shepherd, 20 E Delaware Pl , Chicago Ill , No 296, George F Henniksen 532 Fourth St , Camas, Wash , No 297, Peery Duderstadt 4042 N Francis St , Chicago, Ill , No 298, Albert Joseph Sica, 413 E 202nd St , Bronx N Y C , No 299 Herman Albert Timpf, 26 Hubbard Ave , Mt Clemens, Mich , No 300, Gene B Cook, 10 So Wash , Iola Kans , No 301, Catherine G Glennon, 20 E Delaware Pl , Chicago Ill , No 302, Charles E Green, Pittsfield, N H



(Motion No 58) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION

E F KELLY *Secretary*

# LETTER NO 20

April 28 1936

To the Members of the Council

125 *University of Southern California Student Branch* The following application has been received together with the applications for membership and the dues for 1936

We the undersigned, having conceived a favorable opinion of the aims and purposes of the AMERICAN PHARMACEUTICAL ASSOCIATION and being of the opinion that we could successfully maintain a Student Branch of the Organization in the City of Los Angeles in the State of California, hereby respectfully petition you to approve the formation of a Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION in said city and state to be known as the University of Southern California Student Branch and the By-Laws submitted herewith

Harold Miller	Rose Ratner	Sam Presser
Albert H Musick	Frances Fisch	Alberta Todd
Sidney Friedman	Ernest Yamaguchi	Charles Chase
Peter Bedrosian	Masaru Masuoka	Peggy Woods
Herman Weiner	Al Jannard	John Toshiyuki
Francis R Daney	David Ostrom	Maurice Miller
Gordon D Sherer	Philip W Sanford	Andrew Kalick
Philip Lam	Henry Luis Roman	Hugh H Bubar
Deran Tashjian	Charles Comstock	Gerald Hasimoto
Leo Bittel	Aaron Land	Claus Amgren'
Mildred Sprinkle	George Sonoda	

The following officers have been elected *President* Harold Miller *Honorary President* Albert Musick *Vice President* David Ostrom, *Secretary*, Masaru Masuoka *Treasurer* Ernest Yamaguchi, *Faculty Advisors* Harold R Bowers and Alvah G Hall

The following is the Preamble and By Laws

In order to stimulate a greater professional and scientific interest in the students at the College of Pharmacy, University of Southern California, in the City of Los Angeles and vicinities we the undersigned, do hereby resolve to constitute ourselves into a Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION for the purpose of advancing the objects for which the body was founded The branch hereby adopts for its guidance the Constitution and By Laws of the AMERICAN PHARMACEUTICAL ASSOCIATION, and its members hereby subscribe to them

ARTICLE I *Members* This branch shall consist of active and associate members

ARTICLE II *Active Members* All members of the University of Southern California College of Pharmacy Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION shall be members regularly enrolled in Pharmacy in the University of Southern California College of Pharmacy on signifying their intention of adhering to the provisions enumerated in the Preamble and in the Constitution of the AMERICAN PHARMACEUTICAL ASSOCIATION shall be elected to active membership in this Branch

ARTICLE III *Associate Members* Any person who is not an active member but who manifests his interest either by contribution or active participation of work or research scientific papers or add to its financial resources, shall be termed an associate member but without the right to vote

ARTICLE IV *Officers* The officers of the Branch shall be a president vice president secretary and treasurer

ARTICLE V *Committees* At the September meeting of each year or as soon thereafter as possible the president shall appoint three standing committees as follows A Committee on Program, to consist of three members, A Committee on Student Activities, to consist of three members and a Committee on Membership to consist of three members

ARTICLE VI *Executive Committee* The officers of the branch and the chairmen of the

Standing Committees shall constitute the Executive Committee, to transact all the necessary business usually transacted by such a committee

**ARTICLE VII Meetings** The meetings of the Branch shall be held at least once a month and as many more times as might seem advisable from the opening date of school each year to the close Date of the meeting to be selected by the officers of the Branch

**ARTICLE VIII Quorum** One third the membership shall constitute a quorum

**ARTICLE IX Fiscal Year** The fiscal year of the Branch shall be from the first of January until the first day of January of the following year

**ARTICLE X Elections** The officers shall be elected by ballot by a majority, at the last meeting held in the college year, *i e*, from September to June, and shall be installed at the first meeting in September, and shall serve for one year, or until their successors have been elected Nominations for officers shall be made at a meeting previous to the meeting at which the election is held Written notice of both meetings shall be sent to all members

**ARTICLE XI Presiding Officers** In the absence of the president, the next succeeding officer shall take the chair

**ARTICLE XII Secretary** The secretary shall keep fair and correct minutes of the proceedings of the meetings and send reports of the same to the JOURNAL OF THE A P H A as often as is required, and to such journals and newspapers as he may deem proper He shall preserve on file, all reports and papers of every description presented to the branch, and shall be charged with the necessary business and scientific correspondence He shall read all papers handed to him by the president for the purpose, shall call and record ayes and nays, whenever they are required to be called, shall notify the chairman of every standing and special committee of his appointment giving him a list of his colleagues and stating the business upon which the committee is to act He shall notify every member at least one week in advance of the time and place of the meeting

**ARTICLE XIII Treasurer** The treasurer shall collect and take charge of the funds of the Branch and shall give receipts for the same He shall pay no money except upon the order of the secretary countersigned by the president and accompanied by the proper vouchers He shall present a statement of conditions at each December meeting of the Branch He shall receive the amount of his expenses incident to the duties of his office

**ARTICLE XIV Order of Business** (1) Reading of the minutes of the previous stated meetings, (2) Introduction of newly elected members, (3) Unfinished or deferred business, (4) New Business (5) Program, (6) Nominations and elections, (7) Good and welfare (8) Adjournment

**ARTICLE XV Miscellaneous** Every proposition to alter and amend these By Laws shall be submitted in writing at a stated meeting of the Branch, and may be balloted for at any subsequent stated meeting, when upon receiving the votes of three fourths of the members present, it shall become a part of the By Laws

**ARTICLE XVI Rules of Order** On all points not specifically mentioned in the By-Laws governing this section the By Laws of the AMERICAN PHARMACEUTICAL ASSOCIATION shall take precedence over the other decisions on parliamentary rule

(*Motion No 59*) It is moved by Kelly that the application to establish a Student Branch in the College of Pharmacy, University of Southern California, and the proposed Preamble and By-Laws be approved

**126 Will of George M Beringer** Recently the ASSOCIATION was advised by George M Beringer, Jr, and the Camden Deposit & Trust Company, Executors and Trustees, of a proposed exchange of certain real estate, involving the payment of money to the estate, located in Merchantville, N J, which will be submitted to the Court for ratification on May 4, 1936

A copy of the Will was secured and the following bequest is quoted "(f) AMERICAN PHARMACEUTICAL ASSOCIATION as a contribution to the invested maintenance fund for Pharmacy Headquarters Building, Twenty five Hundred Dollars "

Mrs Beringer has a life interest in the estate A copy of the Will is being filed with other papers of the ASSOCIATION and a copy is being furnished to the Chairman of the Committee on Property and Funds

**127 Reference Samples of Rennin** Chairman Gathercoal writes that it becomes necessary to furnish Reference Samples of Rennin to those who will assay Rennin under the N F VI monograph for this product and that he has arranged for the supply of 60-10 Gm vials of stand-

ardized Rennin, properly labeled at a cost which will be fully covered including containers and labels and transportation costs by a price of \$1 00 per vial or \$10 00 per dozen vials, transportation paid, to those who order the Reference Samples

This is the only Reference Sample required in the N F VI and it is hoped that arrangements can be made to supply the Rennin samples with U S P Reference Samples The price recommended is the same as is charged for the U S P Reference Samples

(*Motion No 60*) It is moved by Kelly that the 10 Gm Reference Samples of Rennin, N F VI be furnished at \$1 00 per vial or at \$10 00 per dozen vials, transportation paid, and that the cost for the samples, including transportation and other necessary expenses, be charged to the N F VI, and that the receipts from the sale of the samples be credited to N F VI

128 *Use of Text of N F VI* Chairman DuMez of the Committee on Publications has submitted the following recommendations on requests for permission to use the text of N F VI

'It is recommended that permission to use portions of the text of the N F VI for comment in a book entitled Pharmacology, Materia Medica and Therapeutics' be granted to Charles Solomon on the same conditions under which permission was granted before and that the customary fee of \$5 00 be charged

I have gone over the manuscript of Dr McGehee's 'Textbook of Dental Pharmacology, Materia Medica and Pharmacotherapeutics,' and find that the manner and extent of use of the text of the N F is satisfactory I therefore recommend that permission to use said text be granted to the publishers P Blakiston's Son & Co, Inc, and that the usual fee of \$5 00 be charged "

(*Motion No 61*) It is moved by DuMez that Charles Solomon and P Blakiston's Son & Co, be granted permission to use portions of the text of the N F VI in Pharmacology, Materia Medica and Therapeutics and in McGehee's Textbook of Dental Pharmacology Materia Medica and Pharmacotherapeutics " respectively with the customary acknowledgment and the usual fee of \$5 00 in each case

129 *Applicants for Membership* The following applications properly endorsed and accompanied with the first year's dues, have been received

No 303 George W Fillauer, 930 E Third St Chattanooga Tenn, No 304 Lucas Luis Velez, Carretera No 9, Rio Piedras P R, No 305 George Miller College Station Box 741, Pullman Washington, No 306 Junichi Tomita, College Station Box 405 Pullman, Washington, No 307 Harold Miller 5632 Fernwood Ave Los Angeles, Calif, No 308 Sidney J Friedman, 1948 Judson St, Los Angeles, Calif No 309, Peter Bedrosian, 942 W 34th St Los Angeles, Calif, No 310, Herman Weiner 4216 S Figueroa St Los Angeles Calif, No 311, Francis R Daney, 349 W 34th St, Los Angeles Calif, No 312 Gordon D Sherer 1237 S Bronson Ave Los Angeles, Calif No 313 Deran Tashjian 4532 Abbey Pl Los Angeles Calif., No 314 Leo Bittel, 942 W 34th St Los Angeles Calif No 315 Mildred Sprinkle 815 W 37th St, Los Angeles Calif, No 316 Rose Ratner 10140 La Tuna Canyon Rd Roscoe, Calif, No 317, Frances Fisch, 7013 Malabar St, Huntington Park, Calif No 318, Ernest Yamaguchi, 923 W 35th St, Los Angeles Calif, No 319, Masaru Masuoka 1016 1/2 S Catalina, Los Angeles, Calif, No 320 Al Jannard 721 W 30th St, Los Angeles Calif No 321 David Ostrom 928 W 37th St, Los Angeles Calif, No 322 Philip W Sanford 837 W 36th Pl, Los Angeles Calif, No 323 Henry Luis Roman 942 W 34th St, Los Angeles Calif, No 324 Charles Comstock, 5339 11th Ave, Los Angeles, Calif, No 325 Aaron Land 1638 W Adams St Los Angeles Calif, No 326 Sam Presser 355 N Breed St, Los Angeles Calif, No 327, Alberta Todd 604A E Broadway Los Angeles Calif No 328 Charles Chase, 721 W 30th St, Los Angeles Calif, No 329, Peggy Woods, 912 Roop St Susanville, Calif, No 330, John Toshiyuki 260 E First St, Los Angeles Calif, No 331 Maurice Miller, 5545 Fountain Ave, Los Angeles Calif, No 332, Andrew Kalick 1305 West Blvd Los Angeles, Calif No 333, Hugh H Bubar, 3705 Diviggins St, Los Angeles, Calif, No 334 Gerald Hasimoto, 923 West 35th St, Los Angeles, Calif, No 335 Claus Amgren 2212 1/2 Berkeley St, Los Angeles, Calif

(*Motion No 62*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION

E F KELLY, *Secretary*

## LETTER NO 21

May 13, 1936

*To the Members of the Council*

130 *Use of Text of the N F VI* Motions No 55 and 56 (Council Letter No 19 preceding) and Motion No 61 (Council Letter No 20, preceding) have been carried and the parties to whom permission was granted have been so advised

Chairman DuMez of the Committee on Publications writes

"I have carefully reviewed the material from the N F VI which Dr Irwin Sugar requests permission to use in preparation of a reference book for Chiropractors, and find it to be entirely satisfactory. Only about 36 formulas are given and directions for making the preparations are omitted in all cases

"I, therefore, recommend to the Council that permission be granted to Dr Irwin Sugar to use portions of the text of the N F VI for comment in a reference book for Chiropractors"

(*Motion No 63*) It is moved by DuMez that Irwin Sugar, Chicago Ill., be granted permission to use portions of the text of the N F VI in a reference book for Chiropractors with the customary acknowledgment and at the usual fee of \$5.00

131 *Refunding Loan on Lot No 7* Motion No 57 (Council Letter No 19, preceding) was carried and Treasurer Holton and Secretary Kelly completed the loan from the Maryland Trust Company on May 1, 1936. S. L. Hilton acknowledged the note and deed of trust as attorney in fact for the Association. The loan formerly held by the George Washington University was paid off. The District Title Insurance Company prepared and checked all of the papers and attended to releasing the former deed of trust and recorded the new one, and the charges amounted to \$107.95, including legal fees

132 *Election of Members* Motion Nos 58 (Council Letter No 19 preceding) and 62 (Council Letter No 20, preceding) have been carried and applicants for membership numbered 286 to 335, inclusive, are declared elected

133 *University of Southern California, Student Branch* Motion No 59 (Council Letter No 20, preceding) has been carried and the application and the Preamble and By-Laws are approved

134 *Reference Samples of Rennin* Motion No 60 (Council Letter No 20, preceding) has been carried and the samples will be handled as directed

135 *Corrections in N F VI* Attached is a list of 54 corrections approved by the Committee on National Formulary for issuance at this time

Twenty two of the proposed corrections were submitted in Council Letter No 17, page 365 and approved. They are as follows: Pages 5—line 4, 5—line 26, 7—line 36, 41—line 6, 45—line 27, 159—line 8, 164—line 13, 250—line 25, 353—line 14 A, 372—line 39, 494—line 11, 515—line 33, 515—line 44, 535—line 27, 536—line 25, 537—line 2, 540—line 24, 541—line 12, 542—line 2, 543—line 53, 545—line 38 and 545—line 39

It is planned to issue this list of corrections in printed sheets, 6 x 9 inches, in the form here with submitted, and printed on one side and so arranged that they can be inserted in the front of the book or that each correction can be cut out and pasted over the material it is to replace

It is also planned to send the following bulletin to the pharmaceutical, medical, dental, veterinary, hospital and chemical publications, to secretaries of pharmaceutical associations and state boards, to schools and colleges of pharmacy, to member firms of the A. D. M. A., A. P. M. A., N. W. D. A., F. W. D. A. and the Proprietary Association

Since the National Formulary, Sixth Edition, was issued on December 16, 1935, many interested persons have read the book very critically, and quite a number of corrections in the text have been suggested

These proposed corrections included simple typographical errors, a few errors in the tolerance figures for the alcoholic content of certain galenical preparations, and a few changes in dose statements

The Committee on National Formulary has given each of the suggestions very careful consideration and has compiled a list of 54 corrections to be made in the first printing of the N F VI, bearing official coupons with serial numbers from 100 001 to 125 000. The corrections have been approved by the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION and will be made in subsequent printings of N F VI.

'A list of these corrections, printed on one side of the sheet, is available, without cost and is so arranged that the sheets can be inserted in the front of the N F VI or that each correction can be cut out and pasted over the wording it is to replace.

'Requests for the list of Corrections in N F VI may be sent to Mack Printing Company, Easton, Penna. or to the AMERICAN PHARMACEUTICAL ASSOCIATION 2215 Constitution Avenue Washington D C, and *must be accompanied by a self addressed stamped envelope to insure delivery*."

(*Motion No 64*) It is moved by Kelly that the proposed corrections, Items 23 to 54 inclusive in the text of N F VI be approved that the corresponding corrections be made in the plates before the second printing of the N F VI and that a list of the approved corrections in the form above indicated and without charge be issued covering the first printing.

136 *Applicants for Membership* The following applications properly endorsed and accompanied with the first year's dues have been received:

No 336 Mancel Havren White, 3001 Live Oak St Dallas Texas, No 337 Weyland D Sears 816 Seward St Evanston Ill, No 338, Bernice Berry Brown 4301 Oak Lawn Ave Dallas Texas, No 339 Marvin Bryant Neal Crossett Ark, No 340 Isabelle Seismann 10111 118th St Richmond Hill N Y No 341 Saul Asnis 2784 W 36th St Brooklyn, N Y, No 342 Ettore John Graziano 9465 Ridge Blvd Brooklyn N Y No 343 John O N Casey, 2100 Darby Road So Ardmore Upper Darby Penna No 344 D P Lillich Dundalk Bldg Dundalk Md No 345 Charles Everett Erickson, Loomis Nebr No 346 Leonard Eugene Mc Hugh 91 N Edgewood Ave La Grange Ill No 347 Herbert N van Nostrand 191-202-119th Ave St Albans N Y No 348 Isadore Wexler 2 Forsyth Place Newburgh N Y, No 349 William Julius Smith 114 N Columbia St Chapel Hill N C

(*Motion No 65*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION

137 *Request for Additional Compensation on account of Printing and Binding the N F VI* The Mack Printing Company have submitted after a personal visit to the ASSOCIATION'S office, a request for the following compensation in addition to the bill submitted in accordance with the terms of the contract:

To cover additional cost for overtime and double time for night and Sunday work, required to meet a shortened delivery date	\$322 71
To cover an 8% increase in production cost affecting composition and presswork only arising from compulsory wage increase by Federal Legislation	321 43
To cover interest on the paper investment made 2 1/2 years prior to the issue of the N F VI	299 10
	<hr/> \$943 24

The Company has submitted a detailed review of the reasons for these additional expenses which are summarized as follows:

The contract revision in 1934 included a 20% estimated increase in wages whereas the actual increase proved to be 36% due to the scale of wages the decrease in hours of the working week and the expenses of Code compliance.

The original contract was based on a production period of sixty days whereas it became necessary to produce the book in forty five days so that it would be issued in 1935 which required overtime at a higher rate of pay.

The necessary paper stock was purchased in 1933 when the original contract was signed. The paper cost \$1994 07 and would have cost when used not less than \$2653 11. It was not

expected that the work would be delayed so long and a 6% interest carriage charge is requested since the paper was paid for when purchased

For the information of the Council a similar request was submitted on account of the U S P, was investigated by a special committee and approved by the Board

The request on account of the N F VI with detailed explanation was submitted to Chairman DuMez of the Committee on Publications who wrote as follows

'As I understand it, the main point at issue is whether or not we wish to stand strictly by the contract or whether we desire to be somewhat lenient with the Mack Printing Company. The latter will have to be disposing of a good many National Formularies for us in the next ten years and it is my opinion that we cannot afford to antagonize them. I would therefore recommend honoring their request in full if necessary."

and to Acting Chairman Hilton of the Committee on Finance who approved the request

(*Motion No 66*) It is moved by Kelly that the request of the Mack Printing Company for additional compensation on account of the printing and binding of the N F VI, as submitted above, be approved and that they be paid the amount requested \$943 24. A vote on the motion will be called for in about ten days

138 *American Association for the Advancement of Science* The following letter has been received from Dr Henry B Ward, Permanent Secretary

"At a meeting of the executive committee held in Lancaster, Pa., April 18th and 19th, the committee approved the transfer of the AMERICAN PHARMACEUTICAL ASSOCIATION in the list of affiliated societies from the Section on Chemistry to the Section on Medical Sciences"

The AMERICAN PHARMACEUTICAL ASSOCIATION was originally affiliated with Section C (Chemistry) and with Section N (Medical Sciences) and was listed as affiliated with the former

It will be recalled that the A A A S recently created sub sections of Section N for Dentistry and for Pharmacy and the A P H A is therefore listed as affiliated with that section

The Executive Committee of the A A A S has approved the appointment of the following members to act as an executive committee for the sub section on pharmacy: Dr John C Krantz, Jr, *Chairman*, Dean R A Lyman and Dean Wortley L Rudd

139 *American Physical Society* This Society holds its annual meetings at the Bureau of Standards and at the National Academy of Sciences. Some time ago officials of the Society inquired if one of its sections could meet in our Building on Saturday, May 2nd and were assured that this would be entirely agreeable

The following letter has been received from Dr W L Severinghaus, Secretary of the Society

"As you know the American Physical Society was confronted with the largest program in its history at its Washington meeting on April 30, May 1 and 2, 1936. We were at a loss to know where to hold our meetings and you very kindly came to our rescue and offered us your meeting room in the Pharmaceutical Building. The Society passed the following resolution which I transmit to you with pleasure:

'Resolved, that the American Physical Society express to the AMERICAN PHARMACEUTICAL ASSOCIATION deep appreciation of its courtesy in offering to the Society the use of its auditorium for the meetings on Saturday morning and afternoon."

E F KELLY, *Secretary*

#### CORRECTIONS IN N F VI \*1

To Be Made in Books No 100 001 to No 125,000

\* April 27, 1936, *National Formulary Bulletin* pages 2291-2293

1 *Corrections in N F VI*—Through oversight, the list of 54 corrections was not attached to Council Letter No 21, see item No 135 page 471. The list is attached hereto

E F KELLY, *Secretary*

Page	Line	
v	4	<i>Change Phar M to Ph M</i>
v	26	<i>Change Phar M to Ph M</i>
7	36	<i>Change One liter equals 1000 27 cc to One liter equals 1000 027 cc</i>
33	22-26	<i>Change to Ampuls of Dextrose contain a sterile solution of 50 Gm of dextrose in a sufficient quantity of ampul water to make 100 cc, unless another concentration of the solution is stated on the label and yield an amount of anhydrous dextrose, <math>C_6H_{12}O_6</math>, corresponding to not less than 86 per cent and not more than 96 per cent of the labeled amount of dextrose</i>
35	16-18	<i>Change to solution is stated on the label, and yield an amount of anhydrous emetine hydrochloride <math>C_{27}H_{40}O_4N_2 \cdot 2HCl</math> corresponding to not less than 84 per cent and not more than 92 per cent of the labeled amount of emetine hydrochloride</i>
35	39	<i>Change 0 006794 Gm to 0 005533 Gm</i>
35	40	<i>Change <math>C_7H_{10}O_4N_2 \cdot 2HCl \cdot 7H_2O</math> to <math>C_{27}H_{40}O_4N_2 \cdot 2HCl</math></i>
41	6	<i>Change contained to contain</i>
45	27	<i>Change 0 005846 Gm to 0 005845 Gm</i>
50	39-41	<i>Change to Place 10 cc of Water in a clean test-tube and add 2 drops of methyl red <math>p_H</math> indicator no orange color develops, indicating a hydrogen ion concentration of not less than <math>p_H</math> 5.8 Another 10 cc portion of Water does not show a pink color</i>
52	10-14	<i>Change to Macerate a weighed amount of the recently cut and partially dried dormant twigs of <i>Hamamelis virginiana</i> for about 24 hours in about twice their weight of water, then distil until not more than 850 cc of distillate is obtained for each 1000 Gm of the twigs taken, add 150 cc of alcohol to each 850 cc of distillate, mix thoroughly</i>
52	31	<i>Change 13 to 15 to 14 to 15</i>
53	33-37	<i>Change to Place 10 cc of Redistilled Water in a clean test tube and add 2 drops of methyl red <math>p_H</math> indicator no orange color develops, indicating a hydrogen ion concentration of not less than <math>p_H</math> 5.8 Another 10-cc portion of Redistilled Water does not show a blue color on the addition of 5 drops of bromthymol blue <math>p_H</math> indicator indicating a hydrogen ion concentration of not more than <math>p_H</math> 7.0</i>
66	47	<i>Change 3 6724 Gm to 3 7473 Gm</i>
68	26	<i>Change 1 cc to 4 cc</i>
77	21	<i>Change didymium to neodymium praseodymium</i>
89	45	<i>Omit "Lutein," transfer or to between 'Extract and Colora Lutea'"</i>
117	3	<i>Change 21 to 24 to 24 to 28</i>
112	21	<i>Change 22 to 24 to 23 to 26</i>
122	13	<i>Change 1 cc to 0.1 cc</i>
138	4	<i>Omit 1 Gm of the Extract represents 2 Gm of aloe</i>
159	8	<i>Change 9 27 Gm to 0 27 Gm</i>
162	3	<i>Change 57 to 63 to 52 to 57</i>
164	5	<i>Change 0.1 Gm to 0.1 cc</i>
164	13	<i>Change in each 100 cc, 3.75 U S P to in each 0.1 cc 3.0 U S P</i>
180	31	<i>Change 12 to 18 to 17 to 21</i>
187	3	<i>Change Gel Ephed to Gel Ephed Sulf</i>
205	34	<i>Change to Average dose Metric, 1 Gm —Apothecaries, 15 grains</i>
210	35	<i>Change 12 mm to 10 mm</i>
244	25	<i>Change 8 Gm to 6 Gm</i>
250	25	<i>Change Compositæ to Composita</i>
317	38	<i>Change the walls to the cell walls</i>
353	14-a	<i>Add Distilled Water a sufficient quantity</i>
372	39	<i>Change 10 cc to 100 cc</i>
393	36-a	<i>Add Dogs 0.2 cc per Kg of body weight</i>
397	26	<i>Change 57 to 63 to 63 to 69</i>

397	27	<i>Change to Average dose</i>	Metric, 0.5 cc — Apothecaries, 8 minims
424	3	<i>Omit Analgesic Balm</i>	
434	3	<i>Change contain to each contains</i>	
439	38	<i>Change Potassium Hydroxide to Sodium Hydroxide</i>	
475	20	<i>Omit (Paris Green)</i>	
494	11	<i>Change March 1 to June 1</i>	

## INDEX

Page	Column	Line	
515	2nd	33	<i>Change 473 to 474</i>
515	2nd	44	<i>Change 476 to 475</i>
535	2nd	27	<i>Change 313 to 131</i>
536	2nd	25	<i>Change Compositæ to Composita</i>
537	2nd	2	<i>Change Mercurous Chloride, Iodide to Mercurous Iodide</i>
540	1st	24	<i>Change 475 to 479</i>
541	1st	12	<i>Change 434 to 435</i>
542	2nd	2	<i>Change Potassium Acetate Hydroxide, to Potassium Hydroxide</i>
543	2nd	53	<i>Omit Red, Phenol, Test Solution</i> 482
544	1st	40	<i>Change Rocella to Rocella</i>
545	2nd	38	<i>Change 208 to 308</i>
545	2nd	39	<i>Change 340 to 240</i>

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, MEETING WILL  
BE HELD IN ROOM K 307 SCHOOL OF MEDICINE AND DENTISTRY, UNIVERSITY  
OF ROCHESTER

(N) MEDICAL SCIENCES, (N<sub>2</sub>) PHARMACY THURSDAY, JUNE 18 1936—9 00 A M

John C Krantz Jr, *Chairman*

A B Lemon, *Secretary*

Program

- 1 "A Comparison of the Pharmacological Syndromes of Ergostetrine (Ergometrine, Ergotocin, Ergonovine, Ergobasine) and the Ergotovine Ergotamine Group of Ergot Alkaloids" By Marvin R. Thompson School of Pharmacy University of Maryland 10 min
- 2 "Further Observations on the Use of Pigeons in the Standardization of Digitalis Bodies" By H. B. Haag, Medical College of Virginia 10 min
- 3 "Differential Pharmacognosy of the Two Lobes of the Pituitary Gland" By Heber Younglen, Massachusetts College of Pharmacy 10 min
- 4 "Hydrolysis of Sucrose Solutions and Its Significance in the Preservation of Pharmaceutical Syrups" By H. V. Arny and W. C. Mende, Columbia U., College of Pharmacy 10 min
- 5 "Observations on the Assay of Vitamins B and B<sub>2</sub>" By F. K. Riggs and A. Beaty, Rutgers University 10 min
- 6 "Variations in the Electrophoretic Behavior of Gelatin Protected Silver Halide Solutions" By L. S. Tice and W. G. Batt, Philadelphia College of Pharmacy and Science 10 min
- 7 "Titration of Iodides and Iodine in Common Solution" By Wm. Reindollar, Bureau of Chemistry, Maryland State Department of Health 10 min
- 8 "Further Studies on the Effect of Cyanides in Rat Sarcoma" By John C. Krantz, Jr., Ruth Musser, C. Jelleff Carr and Wm. G. Harn, School of Medicine, U. of Maryland 10 min
- 9 "Studies on the Metabolism of Dextrose Fragments" By John C. Krantz, Jr., Ruth Musser, C. Jelleff Carr, T. Nelson Carey and Frances Beck, School of Medicine, University of Maryland 10 min
- 10 "Variations in the Toxicity of Strychnine" By James C. Munch, Temple University 10 min
- 11 "The Minimal Lethal Dose for Fluidextract of Ergot, Ergotovine and Ergonovine" By E. I. Evans, University of Chicago 10 min
- 12 "The Involution of the Mouse Uterus" By Richard A. Deno, Medical College of Virginia 10 min



## GOLDEN ANNIVERSARY ADDRESS \*

BY ROBERT P. FISCHIELIS

This occasion is at once the Anniversary of fifty years of continuous activity by Dean Gregory in a profession serving the public health and the Golden Anniversary of the college which can rightfully be termed his "lengthened shadow." In point of service, Dr. Gregory is the Dean of Deans of the seventy odd American Colleges of Pharmacy. The esteem in which he is held in the realm of pharmacy is due to his charming personality, his patience, tolerance, keen wit and gracious manner as well as to his great ability as an educator and administrator.

Within the span of years covering Dr. Gregory's association with pharmacy profound changes have occurred in the methods of medical practice which have been reflected in the practice of pharmacy. About the time the Buffalo College of Pharmacy was organized Pasteur was completing the researches which led to the development of successful vaccination against anthrax and rabies. Synthetic Chemistry was just beginning to produce the coal tar drugs which have assumed such great importance in the field of medication. Antipyrine, one of the earliest of these was first prepared in 1884. Diphtheria Antitoxin was discovered in 1889, the X Ray in 1895 and Radium in 1898.

The first Federal Food and Drug Act was passed in 1906, the Harrison Anti Narcotic Law in 1914 and the National Prohibition Law of 1919 made its exit some fourteen years later. The first State law requiring pharmacists to be college graduates was passed by the State of New York in 1904. These are but a few of the outstanding events which have passed in parade before the eyes of the guest of honor. His influence upon nearly 2000 pharmacy graduates, his activity within the profession and his work in behalf of the University of Buffalo, have made him a figure of national importance in American Pharmacy.

Anniversaries are occasions for evaluating the past and contemplating the future. As the College of Pharmacy of the University of Buffalo enters its second half century of service, conditions in the practice of pharmacy challenge the best thought and ability of its leaders. We see the actual compounding of medicines taken over by larger manufacturing units and the reduction of the average retail pharmacist to the position of a dispenser of ready-made medicines.

Without adequate control over advertising and production of their remedies the public is being educated by manufacturers to medicate itself and the use of possibly harmful drugs without medical or pharmaceutical advice is being encouraged to the point where the public health demands some type of supervision. Passage of a revised Federal Food and Drug Law giving the U. S. Food and Drug Administration control over advertising, requiring the disclosure of the formulae of proprietary remedies and strengthening the public control over the drug industry, is essential to the public welfare and should be forthcoming at this session of Congress.

The possibility of absorption of the functions of private medical and pharmaceutical practice by the State through some form of Health Insurance is no longer academic. It is seen by some as the only way out of the difficulty of providing adequate service to all the people at a price they can afford. Enrollment of freshmen in 68 colleges of pharmacy throughout the United States dropped 53% between 1924 and 1933. The number of graduates in pharmacy has decreased from one for every 17 drug stores in 1924 to one for every 25 drug stores in 1933. The so-called one man drug store operated by a single registered pharmacist working 96 hours per week or more is unable to cope with the type of competition offered by chain organizations. However, several pharmacists associating themselves for the purpose of conducting a professional establishment may be able to cope with the problems of high rentals, quick merchandising and store management, while providing the indispensable professional service which the public still prefers to receive from private practitioners.

Better organization of professional pharmacists with county and local units becoming integral parts of the National Association of Retail Druggists and the AMERICAN PHARMACEUTICAL ASSOCIATION and observance of a stringent code of ethics which will refuse to subordinate professional service to commercial exploitation, will assure survival of the private practice of pharmacy.

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\* Brief summary of an address at the Golden Anniversary Banquet of the College of Pharmacy, University of Buffalo, April 22, 1936.

# EDITORIAL NOTES

## RECOGNITION OF PHARMACISTS BY SENATE BILL 4390

In the April number of the *JOURNAL* reference was made to the progress of S 4390, introduced by Senator Sheppard and the support given by the Surgeon General. The active interest of the Senator and of the War Department is appreciated. The Bill has now proceeded so that it is on the Union Calendar and there is reasonable assurance for enactment.

Congressman Charles I Faddis of Pennsylvania, who has charge of the measure for the House Committee on Military Affairs, concluded his statement for the Committee by saying "The Committee feels that, under present conditions, proper recognition commensurate with education and qualification of the pharmacists connected with the Medical Corps of the United States Army is lacking. This makes it impossible to secure pharmacists of the proper professional qualifications to fill this most important function connected with the Medical Corps. This legislation will remedy the present condition and will, without additional cost, add to the efficiency of the Medical Corps and give these specialists the recognition in rank to which they are entitled."

This is bringing near conclusion efforts of many years by the AMERICAN PHARMACEUTICAL ASSOCIATION and the result of coöperation by the Senate and House, the Army and the Surgeon General. It is a forward step for pharmacists.

## A QUESTION RELATIVE TO COCAINE ANESTHESIA

An interesting letter appears in the *New York Times* of May 24th, by Dr Carl Koller. Aside from answering the question of fact the latter gives historical data. While there is evidence on the subject, it is a source of satisfaction that Dr Koller, who is well along in years, can answer the question in a personal communication.

In this connection reference may be made to the PROCEEDINGS, A PH A of 1885 and *Squibb's Ephemeris*.

## CALL OF THE SCIENTIFIC SECTION A PH A

The 84th annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Dallas Texas during the week of August 24th.

The officers of the Scientific Section appreciate the interest shown in past years, and are

now making an appeal for support to make the Dallas meeting a success.

The Scientific Section will hold several sessions and for the officers to plan the program we should have, as early as possible the titles of the papers which contributors plan to present, and also short abstracts of same. When submitting the title please advise the secretary whether you will present the paper in person or by title also whether a lantern will be required for presentation. Copies of the abstracts must be in the hands of the secretary at least three weeks before the meeting. Copies of all papers should be in the hands of the secretary before the meeting.

The By-Laws provide that papers shall be presented in duplicate so that one copy will be available for publication and the other copy referred to the Committee on Ebert Prize. In writing the paper the author should follow the procedure outlined in *THIS JOURNAL* page 484. The By Laws also require that before publication all papers presented to the Scientific Section must be passed by the Board of Review of Papers. Authors can assist the Board of Review if, when writing the original paper they will eliminate any non essential material presenting the subject in a short concise form and being particularly careful to avoid duplication of experimental work, statements etc.

H M BURLAGE	FRANCIS E BIBBINS
Chairman Scientific Section	Secretary Scientific Section
	5840 Washington Blvd, Indianapolis, Indiana

## NARCOTIC CONFERENCE

The United States will be represented by delegates in Geneva for the study of illicit narcotic drugs. The convention meets June 8th and Stuart J Fuller, Assistant Chief of the Division of Far Eastern Affairs, H J Anslinger, Commissioner of Narcotics and Frank X Ward, Assistant to the Legal Adviser, are delegates.

## UNIVERSITY OF TEXAS COLLEGE OF PHARMACY

The Pharmacy College will have a display at the University Centennial Exposition in Austin featuring drugs of the scriptures, early pharmaceutical apparatus and indigenous remedies.

## PERSONAL AND NEWS ITEMS

Dr Ibrahim Ragab Fahmy, of the Faculty of Medicine, Cairo, has favored us with a report of the Pharmacognosy Department of the Egyptian University. The report shows plants and scenery of the section in connection with interesting descriptions.

We are indebted to I R. Fahmy<sup>1</sup> for a reprint of "Some Observations on the Action and Methods of Standardization of Hashish."

Dr A B Lemon is the new dean of Buffalo University School of Pharmacy. He joined the faculty in 1916 and has been its secretary for the past 17 years. From 1924-1926, he collaborated with Dr W W Charters in the study and compilation of "Basic Material for a Pharmaceutical Curriculum." He is active in pharmaceutical organizations in examination studies and research promotions.

Dr Marvin R. Thompson has been elected to honorary membership in Rho Chi and was presented with a key and certificate at the Baltimore meeting on May 18th.

Joseph Price, "Holiday House," Wellfleet Mass., has donated, through C Herbert Packard, an interesting illustrated volume on Henry Troth, one of the pioneers among American pharmacists. It is interesting to note such names in the genealogy as Joseph Price, Sarah Remington, etc. The Price family of Salem included many eminent pharmacists who were preceptors of other generations of pharmacists such as Henry Estabrook, S A D Sheppard, etc.

Mrs F W Meissner has favored us with an autobiography of her late husband, a biography of Leo Eliel, by Mr Meissner and Miss Backus, and a brief history of all the drug stores in La Porte. The Meissner Pharmacy will be continued by the family, they are Roger of New York City, Clement, of Denver Colorado, Miss Virginia of La Porte. Frederick, known to radio listeners as 'Fritz Clark.'

Bernard E Read, of the Department of Pharmacology, Peiping Union Medical College has favored us with "Chinese Materia Medica," "Animal Drugs, and Avian Drugs." Also "Chinese Medicinal Plants." Dr Read is the author of these publications published by the *Peking Natural History Bulletin*.

The following were named members of the executive committee for the subsection on pharmacy of the American Association for the

Advancement of Science: Dr John C Krantz, Jr, *Chairman*, University of Maryland School of Medicine, Baltimore Md.; Dean R A Lyman, University of Nebraska, Lincoln, Nebr.; Dean Wortley F Rudd, School of Pharmacy, Medical College of Virginia, Richmond Va.

Professor Charles F Poe, of *Pharmaceutical Chemistry* is mentioned in the lead article of the March issue of the *Atlantic Monthly*, as a result of his association in Paris with James Abbe, international press photographer and news correspondent. The story is entitled 'I, Patience,' written "By Herself." Patience is the eleven year old daughter of Mr Abbe.

Dr James M Dille has recently been appointed associate professor in the College of Pharmacy at the University of Washington under Dean C W Johnson. Doctor Dille will be in charge of the reorganization and development of the Department of Pharmacology. A course in biological assay with experimental work on the assay of the pharmacopoeial and of other preparations is to be begun and upon the completion of the new Pharmacy Chemistry building a laboratory course in experimental pharmacology will be organized.

Doctor Dille has been in the Department of Pharmacology of Georgetown University School of Medicine for the past three years and previously was instructor of Physiology in the College of Pharmacy at the University of Nebraska. He will begin his new duties in September of this year.

Dean R A Lyman, of the College of Pharmacy of the University of Nebraska, represented the American Association of Colleges of Pharmacy at the 19th annual meeting of the American Council on Education, held in Washington on May 1st and 2nd. The meeting was attended by nearly four hundred representatives.

Two members of the first graduating class of the Brooklyn College of Pharmacy, Long Island University, were among the more than 500 persons at the 50th anniversary celebration held on April 21st at the Towers Hotel in Brooklyn, N Y. The two old timers were Dean William C Anderson and Louis Berger.

Senator Morris Sheppard, speaking for the amendment to S 4390 said in part: "At

<sup>1</sup> Pharmacognosy Department, Faculty of Medicine, Cairo.

present those performing the duties of pharmacists in the Medical Administrative Corps are taken from among the enlisted men in the Medical Corps, and they have at first no special knowledge or technical qualifications to fit them for the work. The bill requires that before men shall hereafter be appointed to this position of pharmacist they must be graduates of recognized schools or colleges of pharmacy having four-year courses. The bill adds nothing to the cost of administration but merely provides that as vacancies occur in the position of pharmacists in the Medical Corps they shall be filled by men specially qualified. This will give the Army a group of pharmacists with thorough technical training and attainment."

Dean A. R. Bliss, Jr., of the School of Pharmacy, Howard University, Auburn, Ala., in cooperation with Prof. Lewis W. Lohr, has established a service which is designed to help raise the professional standard of pharmacy and give pharmacists in Alabama information on problems met with in their professional practice.

A statue of Hippocrates was unveiled in the court of the new laboratories of the University of Athens, Greece, during the session of the International Congress of Biology.

Dr. Wm. M. Cogan, dean of Georgetown University School of Dentistry, was given a surprise party by his students on the occasion of his 80th birthday.

Hugh Craig, associate editor of the *Druggists Circular*, delivered the address to the graduates of Columbia University College of Pharmacy.

William B. Day, after a service of thirty years as secretary of the Illinois Pharmaceutical Association and secretary of its Executive Committee, has retired. He was presented by Governor Horner, for the Association, with a handsome gold wrist watch. The Association also elected him *Honorary President* of the Association for life, the office being created for him by vote, tributes by members were paid the faithful officer.

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## OBITUARY

### ELIE HENRY LA PIERRE

Elie Henry La Pierre, *Honorary President* of the AMERICAN PHARMACEUTICAL ASSOCIATION, 1930-1931, died at his home in Cambridge Mass., May 2nd. He was born February 20, 1859, in Wolcottville (Torrington), Conn., the son of Elie F. and Sarah La Pierre. The family moved to Burlington, Vt., where the youth began his education. After his father's death, the

family removed to Cambridge, where the young man's education was continued and here he resided until his demise.

After serving an apprenticeship in pharmacy with J. Ward Hill, he entered Massachusetts College of Pharmacy and graduated with the class of 1880. The Hill pharmacy was purchased by Bayley and Richardson and the graduate pharmacist continued in the employ of the firm until he purchased the pharmacy. He served the community as employee and owner for about sixty-five years—in 1921, he celebrated the 50th anniversary of the beginning of his service with Mr. Hill. (See sketch in JOURNAL, A. P. H. A., for December 1930.)

Professor La Pierre became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1892 and served on a number of important committees. He was elected vice president of the American Conference of Pharmaceutical Faculties in 1909 and due to the death of President Searby, became acting president, presiding at the Richmond meeting.

In 1885, he joined the Massachusetts Pharmaceutical Association and served as its president in 1904-1905. Soon after graduation, Professor La Pierre became active in the affairs of Massachusetts College of Pharmacy and in 1892, member of the faculty, holding positions successively, as instructor in *Materia Medica* and Botany, professor of Applied Pharmacy, instructor in Theoretical Pharmacy, professor of Theoretical and Applied Pharmacy and professor of Pharmacy.

The La Pierre Drug Company, of which the deceased was president, owned several stores in Cambridge and one in Boston; he took an active part in civic affairs, served for many years on the Board of Health as a trustee of the Cambridge Hospital and in other promotions. "With all his varied activities Professor La Pierre remained a professional pharmacist."

The deceased is survived by his widow, two daughters and several grandchildren.

### LEWIS WILLIAM McCONNELL

L. W. McConnell, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1904, died of a heart attack April 24th. Mr. McConnell had been in poor health for several years. He was a pioneer pharmacist of McCook, Nebraska, was highly regarded in the state, active in the affairs of the state association and held life membership in the N. A. R. D.

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## SOCIETIES AND COLLEGES

SOCIETY OF PHARMACOLOGY AND  
THERAPEUTICS

The following officers of the American Society for Pharmacology and Experimental Therapeutics were elected at the recent annual meeting held at Washington *President*, V E Henderson, *Vice President* O H Plant, *Secretary* E M K Geiling, *Treasurer*, C M Gruber, *Councilors* Professor C W Edmunds and G Wallace, *Representative on the National Research Council*, W deB MacNider

MINNESOTA PHARMACEUTICAL  
ASSOCIATION

Chairman Lillis announced the results of the Minnesota election by mail to be as follows the men named to assume office at the completion of 1937 convention of the state association in St Paul The new officers *President* Jesse B Slocumb St Paul, *Vice Presidents* George Kermott Duluth, Len E Merwin Minneapolis Fred G Kustermann St Paul *Secretary* A Roy T Johnson, Minneapolis, *Treasurer*, Charles T Heller, Jr, St Paul, *Executive Committeeman* Roy G Paulson Fairmont Mr Paulson will succeed Charles A Anderson who is this year chairman of the Executive Committee Theodore A Arneson and Joseph Vadheim complete the membership of this committee

IDAHO PHARMACEUTICAL  
ASSOCIATION

The dates for the Idaho convention at Idaho Falls have been changed to June 22nd-23rd instead of June 15th-16th, as originally announced

## AMERICAN MEDICAL ASSOCIATION

Dr James S McLester Birmingham Ala delivered the presidential address at the annual meeting of the American Medical Association in Kansas City (May 11th-15th) *President Elect* J Tate Mason was prevented from attending the meeting Dr John H J Upham dean of the medical school of Ohio State University, is now *President Elect* of the Association

## UNIFORM NARCOTIC LAW

The bill to bring the District of Columbia law for control of narcotics into conformity with the law operating in most States was approved at a hearing May 12th by a special

sub committee of the House District Committee composed of Representatives Schulte Indiana, Wood of Missouri, and Cole of New York

DEPARTMENT OF PHARMACY,  
ALABAMA POLYTECHNIC INSTITUTE

The Business Conference held at Auburn Ala April 15th, was a success and it is contemplated to hold these meetings annually They afford a means of discussing various problems of the pharmacist Professor George Hargreaves presided at the sessions and Dr Townes R Leigh was the principal speaker on the subject, 'The Pharmacopoeia of the United States Its Development and Service'

## AMERICAN CHEMICAL SOCIETY

The Council of the American Chemical Society at its meeting in Kansas City considered the subject of the teaching of chemistry in high schools Another resolution adopted relates to the creating of standards for instructors in educational institutions offering instruction in chemistry

ILLINOIS PHARMACEUTICAL  
ASSOCIATION

Illinois Pharmaceutical Association held an interesting and successful meeting at Springfield May 11th to 13th About 500 were in attendance Among the papers of the meeting were those on U S P and N F by O U Sisson and R E Terry

The new officers are *President* Frank M Hewitt Carbondale, *First Vice President* Joe Allegretti, Chicago *Second Vice President* W E Brown Quincy *Third Vice President* M J Kerwin Joliet, *Secretary* Joseph J Shine Chicago *Treasurer* A W Reinhardt Rockford

A vote of thanks was given to Lee Mrazek, who had served without salary during the past year as secretary of the Illinois Fair Trade Committee On behalf of the Association Governor Horner, of Illinois, presented Mr Mrazek with a handsome traveling bag The recipient of the gift is leaving on a European trip

THE THIRD GERMAN  
PHARMACEUTICAL CONGRESS

The Third German Pharmaceutical Congress was held in Stuttgart Germany, from June

17th to June 21st The pharmaceutical fair was opened by Dr J Schmid, secretary of the Home office and Minister of Commerce Extensive publicity was given to the Congress and also to the section around Stuttgart, depicting the beauties of the Black Forest

### PUBLICITY FOR PHARMACY

Quoting a paper by Loyd E Harris, faculty member of the College of Pharmacy in the University of Oklahoma before the Sixth District National Association of Boards of Pharmacy

"The famous quotation, All I know is what I read in the papers' can easily be applied to the public's conception of pharmacy Contrast, if you will the difference in professional appearance between an advertisement of a cut rate drug store and the publicity of a physician The doctor does not pay for the space that he gets, but is given the front page to tell about his professional practice The drug store space costs real money and everything but pharmacy is put before the reader and with emphasis placed on 'cheap' The majority of druggists are so busy under these conditions, trying to keep the front door open that they are unable to practice and keep up their professional knowledge The busy professional man always has time for each one of his clients, but this class of drug store owners insists upon hasty filling of prescriptions so that the man can get out on the floor again and sell cigarettes at fifteen cents, tax included "

'Members of the State Boards of Pharmacy and faculty members of colleges can do much to promote favorable publicity The schools can give professional training to those entering pharmacy, but it is up to the board members and to our organizations to make and enforce the laws and conditions that will enable them to put this training into practice and keep our profession before the world in a favorable light "

### GRADUATES OF PHARMACY IN JAPAN

About 2000 students were graduated from pharmacy colleges in Japan this spring This is about ten per cent of the present number of pharmacists in the country

## LEGAL AND LEGISLATIVE

### FOOD, DRUG AND COSMETIC BILL REPORTED

On May 22nd the House Committee on Interstate and Foreign Commerce reported a

substitute for the Copeland bill, S 5, passed the Senate last year

Quoting *Bookmeyer Bulletin* in part The report is No 2755 'Under the bill reported false advertising of food, drugs, services and cosmetics is brought under regulation by the Secretary of Agriculture and the Federal Trade Commission The adulteration and misbranding of cosmetics is prohibited Therapeutic devices are brought under control Drugs intended for diagnosing illness, or for remedying under weight or over weight are subject to regulation Foods that are dangerous because of naturally contained poisons rather than added poisons are brought under regulation The addition of poisons to foods is prohibited except where such addition is necessary or cannot be avoided and in such cases tolerances are provided limiting the amount of added poison to the extent necessary to safeguard the public health Definitions and standards of identity are provided under which the integrity of food products can be effectively maintained Informative labeling of foods as to quality and composition is required The distinctive name proviso of the present law is eliminated Authority is provided for inspection of factories making interstate shipments Increased penalties are provided for violations Multiple seizures would be permitted in cases where the Secretary of Agriculture had probable cause to believe that the misbranding was in a material respect false misleading or fraudulent The provision for removal for trial to the jurisdiction of the claimant's residence was changed to permit removal to any district adjacent to the district of the claimant's principal place of business or to any other district which may be agreed upon by the parties A special rule will be asked for, fixing a time for consideration and final passage of the bill and limiting debate "

One of the major changes made in the senate bill by the house committee is the transferring of advertising control from the Food and Drug Administration to the Federal Trade Commission

An amendment requires the Food and Drug Administration to give a manufacturer an official sample of a seized article prior to court trial

Closing of the May issue of the *JOURNAL* does not permit discussion of the variation clause provision and other important questions at this time

### NARCOTICS NOT UNDER SECRET SERVICE

Representative Robert L. Doughton, of North Carolina, introduced a new bill (H R 12556), passed by the House, which provides for the reorganization of the Secret Service with some modifications. The important feature about the new bill is that it does not affect the Bureau of Narcotics, which continues as at present. It transfers to the Secret Service the enforcement division of the Alcohol Tax Unit and the customs agency service of the Bureau of Customs.

### TYDINGS BILL

The Tydings Dies Fair Trade Enabling Act has been reported to the Senate. Favorable action was taken by the Senate Judiciary Committee. The bill has passed.

### ROBINSON PATMAN BILL

Chairman Hatton W. Sumners Wright Patman presented arguments in favor of the granting of the special rule calling for early action on the Robinson Patman Bill. It was approved by the House on May 28th.

### NEW JERSEY FAIR TRADE ACT

Vice Chancellor Alfred A. Stein in an opinion filed at Trenton ruled that the fair trade law is in violation of both the State and Federal constitutions. It is stated that there will be an appeal from the decision.

Stanley B. Simpson, Vice-President of Meyer Brothers Drug Company and editor of *Meyer Druggist* has celebrated the 59th anniversary of his connection with the firm.

Raoul D. Keim, Vice President of E. R. Squibb & Sons was given a dinner on May 27th, by friends, prior to leaving on a 3 months vacation abroad.

**Conference Pharmaceutical Association Secretaries**—*President*, J. W. Slocum Indianola, Io, *First Vice President* Roy S. Warnack, Los Angeles, Calif, *Second Vice President* Wm. B. Day, Chicago, Ill. *Secretary Treasurer*, Carl G. A. Harring, 20 Glen Road Newton Center, Mass, *Members of the Executive Com*

*mittee* F. V. McCullough New Albany, Ind., R. C. Wilson Athens, Ga., J. Lester Hayman Morgantown, W. Va., Dennis E. Murphy Cincinnati, Ohio. *Place of Meeting* Dallas Texas. *Time* August 24-29, 1936.

**Conference of Pharmaceutical Law Enforcement Officials**—*Chairman*, R. L. Swain 2411 N. Charles St. Baltimore, Md. *Secretary Treasurer* M. N. Ford, New State Office Building, Room G 18 Columbus Ohio. *Delegate to the House of Delegates*, Fred Schaefer, Brooklyn, N. Y., *Place of Meeting* Dallas Texas. *Time*, August 24-29, 1936.

**International Pharmaceutical Federation**—*President* Dr. J. J. Hofman La Haye, *Secretary General*, Dr. T. Potjewijd, Leyden, *Secretary*, Oscar Van Schoor, Anvers.

### OFFICERS OF AMERICAN DRUG MANUFACTURERS ASSOCIATION

The following officers were elected by the American Drug Manufacturers Association. *President* A. C. Boylston St. Louis Mo., *First Vice President* Oscar W. Smith Detroit, Mich. *Second Vice President* Dr. L. N. Upjohn, Kalamazoo Mich. *Third Vice President* S. DeWitt Clough N. Chicago, Ill. *Treasurer*, R. Lincoln McNeil, Philadelphia Pa., *Executive Vice President and Secretary* Carson P. Frailey, Albee Bldg., Washington D. C., *General Counsel*, Horace W. Bigelow, Detroit, Mich. *Members of the Executive Committee* Frederick S. Stearns Detroit Mich. George W. Merck Rahway, N. J. John G. Searle, Chicago Ill. Carleton H. Palmer, New York City, A. Homer Smith Philadelphia, Pa.

### OFFICERS OF PROPRIETARY ASSOCIATION

The following were elected officers at the annual meeting of the Proprietary Association held in New York City. *President* Frank A. Blair. *First Vice President* Henry P. Bristol. *Second Vice President* E. K. Hyde, Buffalo. *Third Vice President* J. H. Howe St. Louis. *Secretary Treasurer* Charles P. Tyrrell Syracuse. Alvin G. Brush and Fred E. Rathbun were elected members of the *Executive Committee*.

## BOOK NOTICES AND REVIEWS

*Die Fermente und ihre Wirkungen* (Enzymes and Their Action) Supplement Lieferung 1 (Bd I, Spezieller Teil Hauptteil 1 VII-XV) By PROF CARL OPPENHEIMER, Dr Phil et Med W Junk Verlag, Scheveningsche Weg 74, The Hague, Holland, 1935 160 pp 17 figs 20.5 x 28 cm Price \$6.80 Lieferung 2 and 3 have recently come to hand, same price

The author is an outstanding authority on the subject, the work contains correlated information gathered from literature in the field and constitutes valuable sources for references to literature

Many reviews have appeared in publications largely concerned with the subject and all of them give expression to the work as an international treatise. The *British Medical Journal* states that Professor Oppenheimer is generally recognized as a leading authority, The *Chemical Trade Journal* gives a like credit, *Le Cuir Technique* refers to its comprehensiveness, Swiss, Swedish and German reviews are appreciative of the value of the work rendered by the author

*Magische Gifte (Magic Poisons) Rausch und Betäubungsmittel der Neuen Welt (Intoxicants and Narcotics of the New World)* By PROF VIKTOR A REKO, member of the Academy of Sciences, Mexico 167 pages, cloth RM 6.40 (Price outside of Germany and Switzerland 25% additional) Publishers, Ferdinand Enke Verlag, Stuttgart W, Germany

The author has presented an interesting book on the use of narcotics etc largely by those who use drugs of the kind described, in sections where they have no home ties and are tempted by others who have ventured into wrong doing. The mystery, secrecy excitement and surrounding associations together with a desire to try out the narcotic, leads to a first misstep and to get rid of the effect by the advice of an associate leads to another misuse and brings the person nearer to addiction. Superstition and misinformation are factors. Many of those who go through these experiences follow the sea and become acquainted with life at various ports and the use of habit formers. The book deals with these subjects interestingly, and local adventures are brought into the chapters

The subjects are considered under twelve divisions with an introductory in which there is a general discussion 1 Ololuquii—Eine Pflanze, die hypnotisieren kann 2 Peyotl—

Ein Kaktus, der Gespenster sehen lässt 3 Marihuana—Der mexikanische Haschisch 4 Toloachi—Ein rauchbares Aphrodisiakum 5 Ayahuasca—Der Trank der grauenhaften Träume 6 Colornes—Das Geheimnis der roten Bohnen 7 Simicuichi—Der vergeblich machende Zaubertrank 8 Cotztic Zapote—Eine taumelnd machende Frucht 9 Nanacatl—Der Irrsinnspliz 10 Xomil Xi huete—Der gläserne Sarg 11 Camotillo—Eine Knolle, die den Todestag voraussagt 12 Cohombrillo—Das erlosende Katermittel

The article by H H Rusby on the "The Aboriginal uses of Caapi" JOURNAL of December 1923, explains the ceremonials with Ayahuasca. Other names will be recognized and the effects indicated are readily translated

*Prescription Writing and Formulary* The Art of Prescribing By CHARLES SOLOMON M D, Assistant Clinical Professor of Medicine, Long Island College of Medicine With a foreword by Lewellys F Barker, M D Cloth Price \$4.00 Pp 351, with 32 illustrations Philadelphia, Publishers J B Lippincott Company, Philadelphia

The knowledge and skill requisite to prescription writing is an important part of any physician's preparation for the practice of medicine. Individualization of treatment can be practiced only by those familiar with it. The author of this book has prepared a treatise that should fulfil the needs of practicing physicians, it is simple and written in a well organized and lucid manner and the data are in accord with accepted medical practice and therapeutics. The book is unusually complete for its size and bears the mark of careful editing. The formulary is refreshing in its simplicity, avoidance of polypharmacy and preference of official (U S P and N F) preparations. The medical student and young practitioner of medicine will welcome this book, and all who are charged with the responsibility of prescription writing can glean much from reading it

*Die Harze* A TSCHURCH and ERICK STOCK Third revised edition of A Tschurch, *Die Harze und die Harzebehälter* Band II, Hälfte 2 Teil 1 544 pages 173 figures Gebrüder Borntraeger, Berlin 1935 Price 54 marks, bound 58 marks. This will serve as an announcement of a work which brings up-to-date information on the subject. The senior



author is our honorary member Professor Dr Alexander Tschirch, director of the Pharmaceutical Institute of the University of Berne, Switzerland

*Handbuch Der Pharmakognosie* Zweite Er

weiterte Auflage by A Tschirch The issue has been received from Verlag von Bernard Tauchnitz, Leipzig (Lieferung 18) Further reference will be made to this valuable work in a later issue of the JOURNAL

## NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E G Eberle, 2215 Constitution Ave, N W Washington D C

All manuscripts should be typewritten in double spacing on one side of paper  $8\frac{1}{2} \times 11$  inches and should be mailed in a flat package—not rolled The original (*not* carbon) copy should be sent The original drawings not photographs of drawings, should accompany the manuscript Authors should indicate on the manuscript the approximate position of text figures All drawings should be marked with the author's name and address

A condensed title running page headline not to exceed thirty five letters should be given on a separate sheet and placed at the beginning of each article

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page giving Department School or College The date when received for publication should be given

Numerals are used for figures for all definite weights measurements, percentages and degrees of temperature (for example 2 Kg 1 inch, 20 5 cc,  $300^{\circ}$  C) Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one half hours seven times)

Standard abbreviations should be used whenever weights and measures are given in the metric system *e g* 10 Kg 2 25 cc, etc The forms to be used are cc Kg mg mm, L and M

Figures should be numbered from 1 up beginning with the text figures (line engravings are always treated as text figures and should be designed as such) and continuing through the plates The reduction desired should be clearly indicated on the margin of the drawing All drawings should be made with India ink preferably on white tracing paper or cloth If coordinate paper is used a blue lined paper must be chosen Usually it is desirable to ink in the large squares so that the curves can be more easily read Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches) Photographs intended for half tone reproduction should be securely mounted with colorless paste

Figure ' should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to ' Fig, ' per cent—2 words

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author

References to the literature cited should be grouped at the end of the manuscript under the *References* The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses) The sequence followed in the citations should be Author's name (with initials) name of publication volume number, page number and the date in parentheses Abbreviations for journals should conform to the style of *Chemical Abstracts* published by the American Chemical Society

(1) Author, A Y, *Am J Physiol* 79 289 (1927)

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Editor will appreciate comments from Board of Review and Committee on Publication members authors and others interested

# JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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No 6

## THE NATIONAL FORMULARY EXHIBIT AT THE AMERICAN MEDICAL ASSOCIATION CONVENTION, KANSAS CITY, MO

BY ADLEY B NICHOLS, SECRETARY

The National Formulary was exhibited with considerable success at the recent convention of the American Medical Association, May 11-15, 1936, this being the first actual exhibit of the sixth edition. It was highly gratifying to note the interest displayed in the new volume, not only by those who apparently have been thoroughly familiar with previous issues, but there were many who had only recently become acquainted with the National Formulary, and recognized its importance and value. This was gratifying for it shows that the book more and more is appealing to the prescriber. Very often, when mention was made of the fact that the N F had undergone a marked revision, that its admissions were based upon questionnaires which showed actual use by the medical profession, that more than three hundred old items were deleted and over two hundred new ones added, there would be responses indicating that they were familiar with the situation.

The exhibit proper displayed some of the newer products of the N F. As the accompanying photograph indicates, the center section was used to display some of the new preparations of specific therapeutic value, including Elixir of Aminopyrine, Elixir of Barbital, Elixir of Phenobarbital, Elixir of Sodium Thiocyanate, Emulsion of Liquid Petrolatum with Phenolphthalein, Syrup of Potassium Guaiacolsulfonate, Compound Ointment of Benzoic Acid and Ointment of Coal Tar. The sides of the exhibit were devoted to the old stand-by of vehicles, elixirs being shown on one side and syrups on the other. In this group were included Aqueous Elixir, Iso-Alcoholic Elixir, Red Aromatic Elixir, Syrup of Cherry, Syrup of Cinnamon, Aromatic Syrup of Eriodictyon, Syrup of Glycyrrhiza and Syrup of Raspberry.

Experience with these annual exhibits has demonstrated that greatest interest is shown in the vehicles which are displayed, definitely indicating that physicians are desirous of writing their own prescriptions to suit their needs rather than prescribing those prepared for them.

It was surprising to note the attention given to the new Iso-Elixir and to Syrup of Cherry, many visitors coming to the booth and asking specifically to see these preparations. This situation brings one thing very definitely to mind, this pre-interest was developed largely through the articles of Dr. Fantus in current medical journals and through a talk he had given recently in the vicinity of Kansas City. It shows, therefore, that where these valuable articles are brought directly to physicians, they are readily and largely accepted. If the pharmacists will realize this situation and acquaint the physicians with these items, greater possibilities will be developed.

With each stock bottle of material displayed there was also included a four ounce prescription, showing specifically the application of the article in actual practice, in the case of the Iso-Elixir, several prescriptions were thus illustrated. Tincture of *nux vomica* and aromatic spirit of ammonia were diluted with Aromatic Elixir and with Iso-Elixir, the results presenting a striking contrast. Iso-Elixir was used also as a solvent for one-half grain of phenobarbital per teaspoonful and again for a therapeutic dose of four grains of terpin hydrate. Bromides, chlorides and acids were dispensed with the syrups to demonstrate the masking properties of the latter.

A new eight-page booklet was prepared and distributed to those interested, it covered the salient features of the vehicles with specific applications under each. Another section was given to new preparations of a therapeutic nature similar to those on display. The back cover was used to illustrate actual prescriptions for some of the typical products.

An additional supply of booklets has been printed, available for use with similar exhibits throughout the country or for direct distribution to physicians. A number of the state associations have taken advantage of the material for state, county and local organizations.

The National Formulary has been improved, it contains many preparations in which physicians are greatly interested, as the exhibits at the meeting of the American Medical Association have shown conclusively.

The book is the property of American pharmacy, which means that pharmacists should be thoroughly familiar with it and constantly strive to bring it to the attention of the medical profession.

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#### PRELIMINARY NOTICE FROM THE TRANSPORTATION COMMITTEE

Transportation arrangements for the Dallas meeting have been delayed by the confusion due to the government ruling establishing lower railroad fares throughout the country, which went into effect on June 2nd. Reduced rate excursion fares to Dallas, because of the Texas Centennial Exposition will be in effect and it is expected that a schedule of these special rates will be published in the July number of the JOURNAL.

Arrangements are being made for an optional post convention tour through southern Texas and Mexico to Mexico City and further information about this will also be given in the July number of the JOURNAL.

THEODORE J. BRADLEY, *Chairman*,  
Transportation Committee

# EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave., WASHINGTON, D C

## COMMENCEMENTS

DR GEORGE F ZOOK, president of the American Council of Education, in a recent Commencement Address said "The educational system of this country, from the elementary school to the university, has had thrust upon it the responsibility of producing, as far as possible, the actual conditions of vocational and civic life, so that young people may learn the realities through personal participation "

It has been necessary to set up cooperative arrangements whereby they, while still in school, "may secure those personal revelations and values which come only out of actual work experience "

The viewpoint of some, relative to educational training, has undergone a change in studying the capacities of the prospective students—whether they have good coordination and the schools develop these qualifications, rather than analyzing the activity and trying to train and develop the individuals for it A study of the field for their work should bring the industries nearer to the institutions in which they are trained The aim of pharmaceutical institutions is to develop pharmacists and the knowledge required in the service of the profession, accordingly a study of the adaptability and qualifications of the matriculants is highly important

Alumni represent an asset or liability to the institutions and the profession, commencements mark events in the lives of young men and women and the profession of which they are part—these annual events are periods of perustration

## ASSOCIATIONS

IT WILL be permitted to speak a word of sorrow because of the passing of a faithful representative of the people, the Honorable Joseph W Byrns The high regard in which he was held found expression in his advancement, and his response was in the performance of duty

Notwithstanding that bills in Congress which interest druggists and pharmacists have not been enacted, probably due to very important national legislation and, recently, because of the untimely death of the Speaker of the House, which may make it impossible to bring to conclusion all legislation, the evidence of cooperation of druggists and pharmacists and the organizations represented is gratifying Among the bills are The Tydings, Sheppard, Robinson-Patman, etc The purpose is not to discuss these measures at this time except in the relation mentioned, and to express thanks for the helpfulness and interest in measures in which we are greatly concerned The Senators and Congressmen have given their attention because they realized the importance of them and were prompted by duty

Charles G Merrell, a number of years ago, said "No organization or business will be of real value to the community interests that it is intended to serve unless there be born into it ideals and purposes that are not only beneficial to the drug trade but to our national life as well "

The shaping of these activities is not only responsive to our energies and ideals, but on how we impress the public with our cooperative efforts The attachments

to our profession, business, associations and institutions which make our progress possible are important factors in upbuilding pharmacy and securing the good will of the people. There is no question regarding the advisability of associations by those who have grown with their organization, relative to cooperation and strengthening the bonds that unite its members for better service in the cause for which they are enlisted. The greater number of associations meet during June, which is the reason for this comment, may the members have in mind the association spirit to urge them in the performance of duty.

While it is realized that the nearing of the adjournment of Congress may result in disappointment, those who are charged with promoting the legislation will continue their efforts.

Mention may be made in closing this comment that material changes have been made in the Copeland bill which should, perhaps, be submitted for hearing. This is really a substitute bill and it might have been better if, instead of presenting a new bill, the present Act could have been made effective by amendments.

### THE LIBRARY AND THE MUSEUM

IT IS gratifying to note that the Library of the AMERICAN PHARMACEUTICAL ASSOCIATION is rendering more frequent service to divisions of the Government and to individuals, pharmacists and others. This applies also to a certain extent to the Museum.

Everywhere there is developing a greater interest in the establishment of libraries, commencement addresses refer to such undertakings, some to special selection of books and others for general libraries. Among the addresses noted, including references of the latter type is a gift of \$400,000.00 to Southern Methodist University at Dallas, one of the former is a gift which will make possible the development of an entirely new field in higher education at the University of Maryland—on Transportation."

Carlyle said that the true university of these days (his) is a collection of books. Commenting, President Roosevelt said: "The new goals of society demand that part of the citizen's leisure time be spent in securing a better understanding of the changing governmental, economic and social concepts. Man must be forever bringing his knowledge up to date if his usefulness as a worker or citizen is to be maintained. The public library serves all purposes of civic life—industrial, social, religious and recreational."

It is hoped that possibilities will develop which will make available as a museum the material of the Stabler-Leadbeater Pharmacy, Alexandria, purchased for the AMERICAN PHARMACEUTICAL ASSOCIATION.

C. O. Lee, as *chairman* of the Section on Historical Pharmacy, made a valuable contribution by compiling the titles of articles contributed to that Section, resolutions and reports. It has been impossible up to this time to publish all the lengthier contributions on the histories of state and national associations and of industrial plants. This report supplies a valuable index and represents much work on the part of Chairman Lee.

# SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, Glenn L Jenkins, John C Krantz, Jr.,  
Heber W Youngken, L W Rowe, L W Rising, C O Lee, E V Lynn, W G Crockett,  
Frederick V Lofgren

## THE ASSAY OF SYRUPS CONTAINING HYPOPHOSPHITES OFFICIAL IN THE NATIONAL FORMULARY \*<sup>1</sup>

BY GLENN L JENKINS AND CHARLES F BRUENING<sup>2</sup>

### INTRODUCTION

Five syrups of hypophosphites are official in the National Formulary, and it is the purpose of this paper to develop methods for the assay of hypophosphites in these syrups, since no official methods are given in the National Formulary

In a previous paper (JOUR A PH A, 25, 19 (1936)) concerned with the official hypophosphite salts, the literature for methods of assay was reviewed, and several methods used in assaying these official salts were studied critically Of all the methods of assay tried for the official salts, only two were found satisfactory, the Gravimetric Method and the Bromine Method both yielding excellent results The Gravimetric Method determines the phosphate, formed by oxidization of the hypophosphite, by precipitating as magnesium ammonium phosphate and igniting this precipitate to magnesium pyrophosphate The Bromine Method, a rapid volumetric method, involves the oxidization of the hypophosphite ion to the phosphate ion by means of bromine and determination of the bromine consumed, by titrating the iodine liberated by the excess of bromine These two methods appeared to be applicable to the official syrups and were used in assaying for the hypophosphite content

### EXPERIMENTAL

The following four syrups official in the National Formulary 5th Edition (1926), were compounded Syrup of Ammonium Hypophosphite, Syrup of Calcium Hypophosphite Syrup of Calcium and Sodium Hypophosphites, and Syrup of Hypophosphites The methods used in their preparation were essentially the same as specified in the National Formulary except that all weighings of the salts were made on an analytical balance and volumes made up at 20° C in volumetric flasks The Compound Syrup of Hypophosphites offers several apparent obstacles to the Gravimetric Method as well as the Bromine Method and for this reason was not prepared

A suggested method (1) for the compound syrup is the oxidation by means of nitric and sulphuric acids and determination of the phosphate either by the volumetric molybdate method or the gravimetric method In the gravimetric method the molybdate precipitate is dissolved and the phosphate reprecipitated as magnesium ammonium phosphate finally igniting to the pyrophosphate This method, using either variation, gives satisfactory results

In the preparation of the Syrup of Calcium and Sodium Hypophosphites some difficulty was encountered in obtaining complete dissolution of the sugar Several attempts were made to prepare this syrup using the specified amount of sugar and all met with failure, in that a clear solution was not obtained Finally, the sugar content was reduced from 750 to 600 Gm per liter

\* Scientific Section A PH A, Portland meeting, 1935

<sup>1</sup> From the Department of Pharmaceutical Chemistry University of Maryland, School of Pharmacy

<sup>2</sup> Abstracted from a thesis submitted to the Graduate School of the University of Maryland by Charles F Bruening in partial fulfilment of the requirements for the degree of Master of Science

giving as a final product a clear solution To expedite solution, the contents of the flask were heated to about 70° C

#### MATERIALS

In the preparation of the syrups, the assayed salts reported in the previous paper were used The hypophosphorous acid used official in the United States Pharmacopœia X was manufactured by a well known pharmaceutical house and met the tests for purity as described in the United States Pharmacopœia (2) The assay of this acid is considered here

The methods used and the results obtained are shown in Table I

TABLE I

Method	H <sub>2</sub> PO <sub>3</sub> Per Cent	H <sub>2</sub> PO <sub>3</sub> Gm /Cc
U S Pharmacopœia	31 42	0 3594
	31 41	0 3592
Bromine		0 3817
		0 3811
Gravimetric		0 3818

Excellent checks were obtained by the Bromine Method and the Gravimetric Method The results by the U S Pharmacopœia Method are much lower, although the acid conforms to the required minimum of 31 per cent The United States Pharmacopœia Method determines the acid by titration with standard alkali using methyl orange as indicator

The difference between the results given by the U S Pharmacopœia Method and those given by the other two methods is probably partly due to dissolved hypophosphite salts and partly due to the choice of indicators If phenolphthalein is used in place of methyl orange higher results are obtained

Rosin (3) in determining the delicacy of the test for the detection of oxalic acid in hypophosphorous acid states that commercial hypophosphorous acid contains a little calcium which interferes with the test for oxalic acid Small amounts of calcium and traces of iron were found in this acid and also in another sample of the acid The presence of soluble salts in the acids was indicated by the formation of a precipitate when sodium phosphate solution was added to a diluted aqueous solution of the acid Whether the presence of small amounts of dissolved salts in the acid is responsible for the apparent discrepancies of the methods cannot be definitely stated at this time However for our purpose since only one cc is used per liter in the syrup no great error will be involved in using hypophosphorous acid that contains small amounts of dissolved salts

#### GRAVIMETRIC METHOD

The procedure used for the four syrups follows

Transfer exactly 50 cc of the syrup measured by means of a 50-cc volumetric flask to a 250-cc volumetric flask Wash the 50 cc flask with several portions of distilled water adding the washings to the 250 cc flask and finally make up to the mark with distilled water This dilution to 250 cc was used for the syrup of Ammonium Hypophosphite and Syrup of Calcium Hypophosphite For the Syrup of Calcium and Sodium Hypophosphites and Syrup of Hypophosphites the original 50 cc was diluted to a volume of 500 cc in a volumetric flask In either dilution transfer a 50 cc aliquot to a 500-cc Kjeldahl flask, add 30 cc of nitric acid, 5 cc of sulphuric acid and heat until the contents of the flask boil and begin to darken Then add small amounts of nitric acid and continue to heat until a clear and almost colorless solution is obtained Allow the flask and contents to cool add about 25 cc of water and transfer the solution to a 400 cc beaker, wash the flask with several portions of distilled water, and transfer these washings to the beaker and finally dilute the solution to a volume of 150 cc To the diluted acid solution add 2 Gm of citric acid In the case of the Syrup of Ammonium Hypophosphite the citric acid was omitted Add ammonia (Sp Gr 0.9) to the solution until only slightly acid to litmus Complete the assay following the gravimetric method beginning with the line ' add a few drops of HCl ' etc

In some instances, precipitation of the magnesium ammonium phosphate will not take place at a temperature near the boiling point after the addition of the ammonia, and in such cases the solution was cooled until the first appearance of a precipitate and then rapidly stirred until precipitation was complete. The ignition of the precipitate was made in an electric muffle finally heating to 1000° C for the most satisfactory results.

The results obtained are shown in Table II, the total hypophosphites being expressed as  $\text{H}_3\text{PO}_2$ .

TABLE II

Syrup of	$\text{H}_3\text{PO}_2$ Found	$\text{H}_3\text{PO}_2$ Calculated Theory	Deviation	
	Gm /100 Cc	Gm /100 Cc	Gm /100 Cc	Per Cent
Ammonium Hypophosphite	2 819	2 820	-0 001	-0 05
	2 819		-0 001	-0 05
	2 832		+0 012	+0 4
Calcium Hypophosphite	2 770	2 774	-0 004	-0 1
	2 774		0 000	0 0
	2 768		-0 006	-0 2
Calcium and Sodium Hypophosphites	4 933	4 954	-0 021	-0 4
	4 942		-0 012	-0 2
Hypophosphites	5 460	5 453	+0 007	+0 1
	5 466		+0 013	+0 2
	5 466		+0 013	+0 2

The calculated theory is obtained by using the results of the gravimetric method for the salts.

With the syrup of hypophosphites, it might be mentioned, the weight of sodium salt used was the same as required by the formula although the sample assayed 104.15 per cent of the hydrated salt. In the Syrup of Calcium and Sodium Hypophosphites, however, a smaller weight of the sodium salt was used, this weight being equivalent to the specified weight if the sample had assayed 100 per cent of the hydrated salt.

This method, as developed, appears to be applicable to the syrups as well as to the salts official in the National Formulary. It yields satisfactory results, but has the objection of being an indirect method and is somewhat lengthy.

#### BROMINE METHOD

This rapid volumetric method, giving excellent results for the salts, was used for the syrups and the following procedure adopted:

Transfer exactly 50 cc of the syrup, measured in a 50 cc volumetric flask, to a 250-cc volumetric flask. Wash the 50 cc flask with several portions of distilled water, adding the washings to the 250 cc flask and finally making up to the mark with distilled water. This dilution to 250 cc was used for the Syrup of Ammonium Hypophosphite and Syrup of Calcium Hypophosphite. For the other two syrups the original 50 cc was diluted to 500 cc in a volumetric flask. In either case, transfer a 50-cc aliquot to a 250-cc volumetric flask, and make up to the mark with distilled water. Use 50 cc aliquots and determine the total hypophosphites as outlined in the Bromine Method beginning with the line 'add 50 cc of 0.1N bromide bromate solution'. The time of the standing was 2 hours.

The results are shown in Table III, the total hypophosphites being expressed as  $\text{H}_3\text{PO}_2$ .



TABLE III

Syrup of	H <sub>2</sub> PO <sub>3</sub> Found	H <sub>2</sub> PO <sub>3</sub> Calcu lated Theory	Deviation	
	Gm /100 Cc	Gm /100 Cc	Gm /100 Cc	Per Cent.
Ammonium Hypophosphite	2 813	2 814	-0 001	-0 05
	2 814		0 000	0 0
	2 810		-0 004	-0 1
Calcium Hypophosphite	2 755	2 755	0 000	0 0
	2 756		+0 001	+0 05
	2 754		-0 001	-0 05
Calcium and Sodium Hypophosphites	4 925	4 933	-0 008	-0 2
	4 926		-0 007	-0 1
	4 930		-0 003	-0 05
Hypophosphites	5 377	5 427	-0 050	-0 9
	5 381		-0 046	-0 8
	5 386*		-0 041	-0 8

\* Solution allowed to stand 3 hours

The calculated theory was obtained by using the results of the assays of the salts by the same method

The results for the first three syrups are satisfactory, but those for the fourth syrup are slightly low. In a later Table (IV) a higher yield was obtained for this same syrup

This method, as developed, is applicable to the four mentioned syrups containing hypophosphites official in the National Formulary. The method is a rapid and simple one, results can be obtained in about two and one-half hours. The results are very satisfactory indicating that bromine does not react to any appreciable extent with sugar or glycerine in the concentrations employed in the determinations. The chief advantage of this method is that it is a direct one, determining hypophosphites as such.

#### STABILITY OF THE SYRUPS

It has been noted that when some syrups containing hypophosphites are allowed to stand for a considerable length of time there is a color change, the syrup originally being almost colorless and after a period of time changing to a light yellow-brown color. Some syrups, however, remain almost colorless after a long period of time, indicating that the color change does not always take place and not always with all the syrups. The factors usually affecting stability may be enumerated as ingredients, methods of preparation, preservatives and manner of storage.

In this experiment we attempted to determine the stability of the four syrups prepared from a chemical viewpoint only. That is, we determined the hypophosphite content before and after standing by the Bromine Method and by comparison indicate whether the hypophosphites have undergone any chemical change. Of course, the assumed oxidation to phosphate or possibly phosphite may not be the only change taking place with the hypophosphites, but we limited our field to these changes, since they are the most likely to occur. Any decrease in hypophosphite content in the syrups indicates these changes.

The ingredients used in the syrups are all recognized officially as being stable in air, the only tendency being deliquescence.

The effects on stability by different methods of preparation (with different preservatives) have not been studied. The methods of preparation as described in the National Formulary were used with all the syrups. Hypophosphorous acid is used in all the official syrups and sodium citrate in the compound syrups acting as a preservative although both aid in dissolving the salts. Unofficial syrups containing hypophosphites also use benzoic acid and sodium benzoate as a preservative. These preservatives probably prevent the deterioration of the syrup from a bacteriological action as evidenced by lack of mold formation and possibly from a chemical reaction as well.

Regarding the manner of storage, it is the usual precaution of manufacturers to use amber bottles on the theory that the color change is a photochemical one. In this experiment, however, the four official syrups prepared were placed in clear glass containers and allowed to stand, protected from the light for 3 months. At the end of this period no apparent change was noted with three of the syrups, although the Syrup of Ammonium Hypophosphite became a shade darker than the original syrup.

The hypophosphite contents, calculated as  $H_3PO_2$ , are shown in Table IV, using the Bromine Method.

TABLE IV

Syrup of	$H_3PO_2$ Found in Original Syrup (Average of Table III)	$H_3PO_2$ after 3 Months	Deviation	
	Gm /100 Cc	Gm /100 Cc	Gm /100 Cc	Per Cent
Ammonium Hypophosphite	2.812	2.812	0.000	0.0
		2.816	+0.004	+0.1
Calcium Hypophosphite	2.755	2.758	+0.003	+0.1
		2.757	+0.002	+0.05
Calcium and Sodium Hypophosphites	4.927	4.905	-0.022	-0.4
		4.908	-0.019	-0.4
Hypophosphites	5.381	5.396	+0.015	+0.3
		5.394	+0.013	+0.2

From these results we conclude that the four official syrups examined are stable as far as the hypophosphite content is concerned. The color change noted with the Syrup of Ammonium Hypophosphite is probably due to some of the other substances present rather than to the hypophosphites. These results also give an indication of the precision obtainable with the Bromine Method.

#### DETERMINATION OF CALCIUM

A method, similar to that used in the British Pharmacopœia (3), was adopted for the determination of calcium in three of the official syrups prepared. It differs from the method used in the B. P. which employs only a single precipitation, in that the original calcium oxalate precipitate was dissolved and reprecipitated for the most satisfactory results.

*Procedure*—Transfer exactly 50 cc. of the syrup, measured in a 50-cc. volumetric flask, to a 250-cc. volumetric flask. Wash the 50-cc. flask with several portions of distilled water, adding the washings to the 250-cc. flask, and finally make up to the mark with distilled water. Dilute a 50-cc. aliquot to 100 cc. add 1 cc. of glacial acetic acid, and heat to boiling. Then slowly add an excess

of a saturated solution of ammonium oxalate, and continue to boil until the precipitate becomes coarsely granular. Remove from the source of heat, and allow to stand 4 hours. Decant the clear solution, and filter it through a small filter paper. Wash the precipitate in the beaker by decantation several times with a 1 per cent solution of ammonium oxalate, filtering each portion through the filter. Finally wash the filter with a small amount of the 1 per cent solution. Dissolve any calcium oxalate on the filter paper by means of 10 cc of hot hydrochloric acid solution (1 in 3) and wash the filter with hot water catching the filtrate in the original beaker. Warm the beaker until all the precipitate dissolves. remove from the heat and neutralize with ammonia. Add 1 cc of glacial acetic acid and repeat the precipitation as outlined above. Filter and ignite the precipitate and paper gently until the paper is completely burned. Then add  $\text{H}_2\text{SO}_4$  to the residue fume off the excess and finally heat to constant weight at  $600^\circ\text{C}$ . Weigh as  $\text{CaSO}_4$ .

The results for the three syrups and the calcium salt are shown in Table V

TABLE V

Syrup of	Ca ( $\text{H}_2\text{PO}_4$ ) <sub>2</sub> Found	Ca ( $\text{H}_2\text{PO}_4$ ) <sub>2</sub> Present	Deviation	
	Gm /100 Cc	Gm /100 Cc	Gm /100 Cc	Per Cent
Calcium Hypophosphite	3 498	3 500	-0 002	-0 05
	3 498		-0 002	-0 05
Calcium and Sodium Hypophosphites	3 494	3 500	-0 006	-0 2
	3 497		-0 003	-0 1
	3 548*		+0 048	+1 4
	3 552*		+0 052	+1 5
Hypophosphites	4 480	4 500	-0 020	-0 4
	4 488		-0 012	-0 3
Salt of Calcium Hypophosphite	0 5019	0 5021**	-0 0002	-0 05
	0 5018	0 5020**	-0 0002	-0 05

\* Single precipitation used

\*\* Weight of Sample

Very satisfactory results are obtained by this method, although if only a single precipitation is used high results are obtained

#### CONCLUSIONS

1 In assaying Hypophosphorus Acid the United States Pharmacopœia Method yields low results

2 The Gravimetric Method developed is applicable to the official Syrups of Ammonium Hypophosphite, Calcium Hypophosphite, Calcium and Sodium Hypophosphites, and Hypophosphites. This method is simple and yields almost theoretical results

3 The Bromine Method developed is also applicable to the four official syrups listed in 2. This method is rapid, simple, a direct one and yields excellent results

4 The four official syrups listed in 2 are stable in that the total hypophosphite content remains constant with time

5 A method has been devised to determine the calcium in the official Syrups of Calcium Hypophosphite, Calcium and Sodium Hypophosphites, and Hypophosphites. The method yields satisfactory results

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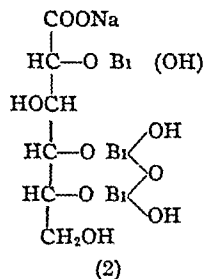
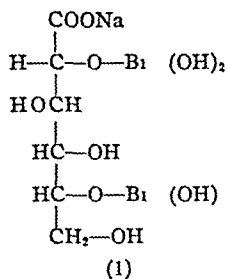
## A STUDY OF BISMUTH SALTS OF GLUCONIC ACID \*

BY W. M. LAUTER AND H. A. BRAUN<sup>1</sup>

Most of the bismuth preparations which have been introduced into medicine for the treatment of syphilis fall into one of the three following groups: (1) water-soluble compounds, (2) oil-soluble compounds, (3) suspensions of insoluble compounds. These groups are named in the order of decreasing rates of absorption and excretion. The choice of a bismuth preparation depends largely upon the rapidity with which it is desired to obtain an effective bismuth concentration in the tissues and also upon the frequency of injection.

Von Oettingen, Ishikawa and Sollmann (1) have described the preparation and constitution of water-soluble mono- and di-bismuthyl citrates. Kober (2) has prepared water-soluble bismuthyl tartrates of very high bismuth content by shaking bismuth hydroxide with sodium tartrate.

Since the water-soluble bismuth salts of gluconic acid have not been described in the literature, a study of these compounds was undertaken using a method of preparation similar to that described by Kober (2). A mono-sodium-di-bismuthyl gluconate (Formula 1) and a mono-sodium-tri-bismuthyl gluconate (Formula 2) have been prepared. Also a product of still higher bismuth content was obtained which apparently is a mixture.



## EXPERIMENTAL

*Preparation of Sodium Di-Bismuthyl Gluconate*—Three hundred and forty-four cubic centimeters of a bismuth subnitrate solution, prepared by dissolving 306 Gm.  $\text{BiONO}_3$  in 300 cc. of concentrated  $\text{HNO}_3$  and made up to a volume of two liters with water, are poured slowly while cooling into a sodium hydroxide solution containing 32 Gm.  $\text{NaOH}$  in 800 cc.  $\text{H}_2\text{O}$ . The bismuth hydroxide is filtered at once and carefully washed with water.

The still moist bismuth hydroxide is then suspended in 150 cc. of water and a solution of 12.3 Gm. of gluconic acid in 12.3 cc. of water and 2.5 Gm.  $\text{NaOH}$  is added to the suspension. The liquid becomes clear and is filtered. The volume is 225 cc. The bismuth salt is now precipitated with 225 cc. of alcohol. A sticky white mass is obtained. The supernatant liquid is decanted, the

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precipitate redissolved in 100 cc of water and reprecipitated with the same volume of alcohol. The precipitate is again separated from the supernatant liquid and again redissolved in 150 cc water. One hundred and fifty cubic centimeters of alcohol are added slowly and the bismuth salt is now obtained as crystals free from sodium gluconate. It is filtered, washed with 150 cc 50 per cent alcohol followed by 95 per cent alcohol and finally with ether. The white crystals are dried at room temperature in a vacuum desiccator. The yield was 48.5 Gm or nearly quantitative. This material when dried to constant weight at 100° lost 9.6 per cent water of crystallization. The product dried at 100° was analyzed for bismuth by the sulphide method.

Analysis  $C_6H_{13}O_{11}NaB_1$  (Formula 1)

Calculated 59.55% B<sub>1</sub> Found 59.63% B<sub>1</sub>

In aqueous solution containing 12 mg of bismuth per cc the  $p_H$  is 9.4. When buffered to a  $p_H$  of 8.7 the solution resists heating at 100°.

*Preparation of Sodium Tri Bismuthyl Gluconate*—A solution of 306 Gm  $B_1ONO_2$  in 300 cc concentrated nitric acid made up to a volume of 2 liters with water is prepared.

Six hundred and eighty-eight cubic centimeters of this solution are poured carefully into a cooled solution of 64 Gm NaOH in 1600 cc water. The precipitated bismuth hydroxide is filtered and thoroughly washed with water. The precipitate is then resuspended in water, filtered again and washed again. It should never be allowed to become dry. The hydroxide is then suspended in 200 cc water and shaken for 30 minutes with a solution of 20 Gm gluconic acid in 20 cc water and 17.2 Gm sodium hydroxide. A slight raise of temperature can be observed. The solution is filtered. The volume is approximately 300 cc. The solution is now poured slowly while stirring into an equal volume of alcohol. The white precipitate is filtered. It is washed once with 300 cc 50 per cent alcohol followed by 95 per cent alcohol. The precipitate is then redissolved in 200 cc water and reprecipitated with 200 cc alcohol. This precipitate is filtered and washed with alcohol. After drying at room temperature for 16 hours in a vacuum desiccator the yield is 64 Gm. This material when dried to constant weight at 100° lost 21.3 per cent water of crystallization. The product dried at 100° was analyzed for bismuth by the sulphide method.

Analysis  $C_6H_{12}O_{12}NaB_1$  (Formula 2)

Calculated 67.71% B<sub>1</sub> Found 67.61% B<sub>1</sub>

As a check on the purity of this product a 15 Gm portion was redissolved in 100 cc of water and 1 drop of *N* NaOH added. The product was precipitated by adding 100 cc of alcohol and collected by centrifuging. It was washed with 150 cc of 50 per cent alcohol followed by 150 cc of 95 per cent alcohol and dried in a vacuum desiccator. 8.5 Gm were recovered. This material when dried to constant weight at 100° lost 22.6 per cent water of crystallization. The product dried at 100° was analyzed for bismuth by the sulphide method.

Analysis  $C_6H_1O_{12}NaB_1$  (Formula 2)

Calculated 67.71% B<sub>1</sub> Found 67.59% B<sub>1</sub>

These results show that the composition of the compound is not changed by reprecipitation.

*A Gluconate of Higher Bismuth Content*—Kober (2) has prepared sodium-tetra bismuthyl tartrate by shaking sodium tartrate with bismuth hydroxide for six days. Using a similar procedure we have attempted to prepare sodium-tetra-bismuthyl gluconate.

One hundred and fifty-three grams bismuth subnitrate were dissolved in 203 cc concentrated nitric acid and made up to a volume of 1125 cc with water. The bismuthyl hydroxide was precipitated with 225 cc 50 per cent NaOH solution. The hydroxide was filtered and washed. Seventeen grams gluconic acid, dissolved in 17 cc water and 14 cc 50 per cent NaOH solution were shaken at room temperature for 8½ days. The suspension was filtered and washed. An equal volume of alcohol was added to the solution and the product isolated by centrifugation and washed by centrifuging with 50 per cent alcohol followed by 95 per cent alcohol and finally with ether. A yield of 96 Gm was obtained.

The vacuum-desiccator-dried product lost 34.8 per cent moisture when dried to constant weight at 100°. Analysis by the sulphide method indicated 73.58 per

cent B<sub>1</sub> However, when this product was redissolved in water, reprecipitated with alcohol and dried to constant weight in a vacuum desiccator, it was found to contain only 6.97 per cent moisture removable by drying at 100°. The product dried at 100° analyzed 71.1 per cent B<sub>1</sub> and was found to be insoluble in water. Thus our attempts to obtain a water-soluble tetra-bismuthyl gluconate corresponding to Kober's tetra-bismuthyl tartrate were unsuccessful.

*Toxicity of the Bismuthyl Gluconates*—These preparations were dissolved in water so that each cc contained 12 mg of metallic bismuth and injected intravenously in rats. This route of administration is not used clinically but has been employed by a number of laboratory workers for rapidly estimating the systemic toxicity of various water-soluble bismuth compounds.

Preliminary experiments seemed to indicate that the tri-bismuthyl gluconate was somewhat less toxic than the di-bismuthyl gluconate. However, more complete studies using a large number of rats indicated that all these gluconates are approximately equally toxic. The minimum fatal dose was found to be approximately 7 mg of bismuth metal per kilo and death occurred on the second to fifth day after injection. Parallel injections of water-soluble citrates and tartrates gave results indicating a similar toxicity.

These results indicate that these various water-soluble bismuth preparations when injected intravenously in rats in equivalent doses of metallic bismuth are approximately equally toxic. The wide differences in the intramuscular toxicities of numerous water-soluble bismuth preparations reported from the literature by Hanzlik, Seidenfeld and Johnson (3) are probably due in large part to differences in rates of absorption from the muscle. When such preparations are injected intravenously the factor of absorption is not introduced and the toxicities are greater and show lesser individual variation.

#### SUMMARY

A mono-sodium-di-bismuthyl gluconate and a mono-sodium-tri-bismuthyl gluconate have been prepared containing 59.6 per cent and 67.6 per cent bismuth, respectively. When injected intravenously in aqueous solution into rats these compounds show a minimum fatal dose of approximately 7 mg of metallic bismuth per Kg which agrees with a similar toxicity observed for some water-soluble tartrates and citrates which were injected in parallel groups of rats.

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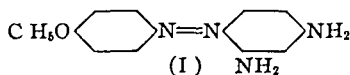
### MERCURY DERIVATIVES OF AZO DYES \*<sup>1</sup>

BY W. BRAKER AND W. G. CHRISTIANSEN

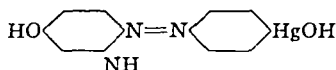
Azo dyes such as the hydrochloride of 2,4-diamino-4'-ethoxy azobenzene (compound I)

\* Scientific Section A. P. H. A. Portland meeting, 1935.

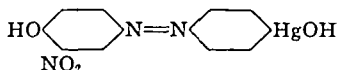
<sup>1</sup> Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.



are used as antiseptics in the treatment of infections of the urinary tract. While investigating dyes more or less closely related to the above it was considered of interest to prepare several examples having an hydroxy-mercuri group attached to one of the benzene nuclei. It was realized that such compounds might be unsuitable for use owing to low solubility and that the only ones which could be expected to be suitable for practical use would have salt-forming groups such as phenolic hydroxyls. Since nitro phenols are more acidic than the unnitrate phenols, a compound containing a nitro group as well as an hydroxyl group was included. Two compounds of this type were prepared, they were, however, insoluble even in excess alkali hydroxide and therefore of no practical interest. The substances were



4 Hydroxymercuri 2' amino 4' hydroxy azobenzene



4 Hydroxymercuri 3' nitro 4' hydroxy azobenzene

Attempts to prepare compounds with still more acidic substituents such as carboxyl and sulphonic acid groups resulted in numerous difficulties such as internal salt formation.

#### EXPERIMENTAL

*Preparation of Para Amino Phenyl Mercury Acetate*—This substance was prepared according to the method described by Whitmore.<sup>1</sup> A white crystalline material of melting point 166–167° C was obtained.

*Preparation of 4 Hydroxymercuri 2' Amino 4' Hydroxy Azobenzene*—10.2 Gm of para amino phenyl mercury acetate was dissolved in 25 cc of concentrated hydrochloric acid contained in 125 cc of water. The substance was diazotized with 2.0 Gm of sodium nitrite. The excess nitrous acid was eliminated by the addition of 0.5 Gm of urea. A solution of 3.1 Gm of meta amino phenol in 100 cc of 15% sodium hydroxide was added at 0° C. The mixture was stirred at 0° C for one hour and at 26° C for three hours. The mixture was then acidified with dilute acetic acid and the dark red flocculent precipitate was filtered off, washed with water and dried *in vacuo*.

Yield 3.75 Gm of a dark red powder.

Assay—Mercury Found 47.07%, calculated for C<sub>14</sub>H<sub>11</sub>N<sub>3</sub>O<sub>2</sub>Hg 46.69%.

*Preparation of 4 Hydroxymercuri 3' Nitro 4'-Hydroxy Azobenzene*—10.5 Gm of para amino phenyl mercury acetate contained in dilute hydrochloric acid was diazotized with 2.5 Gm of sodium nitrite. The excess nitrous acid was destroyed by the addition of 1.0 Gm of urea. 4.5 Gm of ortho nitrophenol dissolved in 100 cc of 10% sodium hydroxide solution was then added at 0° C. The mixture was further stirred for two hours at 0° C and allowed to remain overnight at 25° C. A yellow crystalline material insoluble in this alkaline medium was filtered off, washed with water and dried *in vacuo*. This material was shown by assay to be 4 hydroxymercuri 3' nitro 4'-hydroxy azobenzene. The filtrate of the latter was made slightly acid with hydrochloric acid and the brown precipitate thus obtained was filtered off, washed with water and dried *in vacuo*.

<sup>1</sup> Whitmore "Organic Compounds of Mercury" 210 (1921)

This material was identified by assay as *p* hydroxymercury aniline. Evidently the diazotization had been only partially completed prior to the coupling reaction.

Yield, 2.1 Gm. of a yellow crystalline material

Assay—Mercury Found, 43.25%, calculated for  $C_{12}H_9O_2N_2Hg$ , 43.65%

#### SUMMARY

Hydroxymercury derivatives of azo dyes frequently used as urinary antiseptics have been prepared but have been found to be too insoluble for biological testing.

### MISCELLANEOUS DERIVATIVES OF 8-HYDROXY-QUINOLINE \*

BY E. MONESS AND W. G. CHRISTIANSEN <sup>1</sup>

The alkylation of phenolic germicides frequently increases the activity of the compound. We therefore introduced the propyl group into chloro-8-hydroxy-quinoline. To this end we prepared 5-propyl-8-hydroxy-quinoline and chlorinated it to form 5-propyl-7-chloro-8-hydroxy-quinoline. This compound was incorporated into an oily medium and evaluated by the agar cup-plate method (1). It was found to be less active than the non-alkylated compound, giving a clear zone of only 1–2 mm., whereas chloro-8-hydroxy-quinoline, tested simultaneously with it, showed a 5-mm. clear zone. It is reasonable to believe that a lowered water-solubility, brought about by alkylation, is the reason for its lesser activity.

While 5-chloro-8-hydroxy-quinoline is soluble in oily vehicles, and in such media is a valuable germicide, its usefulness is limited by its insolubility in aqueous solutions. An attempt was therefore made to render it water-soluble by preparing its metho chloride. When prepared, this compound (analogous to the metho chloride of acridine) was readily soluble in water, but its activity was found to be considerably less than that of the original chlorohydroxy quinoline.

Two mercury derivatives of 8-hydroxy-quinoline—*anhydro-mercuri-5-chloro-8-hydroxy-quinoline* and *anhydro-mercuri-5-nitro-8-hydroxy-quinoline*, were prepared for evaluation as germicides. They were obtained as orange-colored, microcrystalline powders, but were found to be insoluble in dilute alkali, and therefore were not tested for activity.

Since the quinoline nucleus is present in certain parasitocides of the quinoline type, we used hydroxy-quinoline as an intermediate in the preparation of two compounds which seemed to offer possibilities of such activity. 5-(Diethylaminoethylamino)-8-hydroxy-quinoline and 8-diethylaminoethoxy-quinoline were prepared and tested as trypanocides. The former showed practically no activity, and the latter, while definitely active, was inferior to other well-known trypanocidal agents.

It was thought possible to obtain derivatives of hydroxy-quinoline which would possess local anesthetic properties, and as an example we prepared the diethylaminoethyl ester of 5-carboxy-8-ethoxy-quinoline. In this synthesis we followed the method used by Matsumura (2) in the preparation of 5-carboxy-8-hydroxy-

\* Scientific Section, A. P. H. A., Portland meeting, 1935.

<sup>1</sup> Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.



quinoline Since we desired the ethoxy compound rather than the hydroxy, we ethylated the 5-benzoyl-8-hydroxy-quinoline before converting to the oxime Our diethylaminoethyl ester was obtained by reacting the sodium salt of the acid with diethylaminoethyl chloride We confirmed the structure of the final compound by preparing it by the Skraup reaction, using methyl-3-amino-4-ethoxy benzoate as the starting material A mixed melting point proved the two end products to be identical When tested as a local anesthetic, the compound was found to be only slightly active

#### EXPERIMENTAL

*Preparation of 2 Nitro p Propyl Phenol (3)*—Forty grams *p* propyl phenol were dissolved in 80 Gm benzene to which solution was added dropwise 96 Gm of a mixture of equal volumes of concentrated nitric acid and water stirring constantly and keeping the reaction mixture cooled to 15–20° C The nitric acid layer was drained off, and the benzene solution was washed with water The benzene was distilled off and the residual oil steam distilled The yellow oil obtained was extracted with ether the latter distilled off and the oil fractionated

Yield—29 Gm of yellow oil b p 110° C at 4 mm

Analysis Found—N 7.52% calculated for  $C_9H_{11}O_3N$ —N, 7.74%

The analysis by the Kjeldahl method was preceded by reduction with hydrosulphite The 0.15 Gm sample in a Kjeldahl flask was dissolved in 5 cc normal sodium hydroxide and 0.5–1.0 Gm of sodium hydrosulphite was added After a few minutes of gentle heating the red solution was decolorized and yellowish white crystals separated The usual Kjeldahl procedure was then followed

*Preparation of 2 Amino p Propyl Phenol*—Ten grams 2 nitro *p* propyl phenol were dissolved in 250 cc of approximately normal sodium hydroxide, and while heating on a steam bath powdered sodium hydrosulphite was added in small portions until the red color had disappeared The mass of silvery gray crystals which separated was filtered off and washed with water

Yield—4.8 Gm, m p 140–142° C

Analysis Found—N 9.17% calculated for  $C_9H_{11}ON$ —N 9.27%

*Preparation of 5 Propyl-8 Hydroxy Quinoline*—Four and five tenths grams 2 amino *p* propyl phenol were mixed with 6.8 Gm arsenic pentoxide and 13.5 Gm glycerin Thirteen and five tenths grams of concentrated sulphuric acid were added and the mixture heated by means of an oil bath was boiled under reflux for four hours It was then cooled and diluted with water The brown residue was filtered off and washed with water The filtrate was neutralized with dilute sodium bicarbonate solution and 2.5 Gm of a brown, slightly tarry substance was obtained The original residue was boiled with three successive 100 cc portions of 5% sulphuric acid and these combined extracts were neutralized with sodium bicarbonate solution Five tenths gram of crude product was thus recovered combined with that obtained from the original solution and the whole dissolved in boiling alcohol A slight insoluble residue was filtered off and the filtrate acidified with alcoholic hydrochloric acid The clear red solution was evaporated to dryness, the residue dissolved in water, treated with charcoal and filtered To the bright yellow filtrate was added a solution of sodium acetate precipitating the base

Yield—1.5 Gm of a grayish yellow powder m p 52–52.5° C

Analysis The Kjeldahl method for nitrogen failed and the Dumas method was useless since the substance exploded Explosion followed an attempt at a carbon hydrogen analysis It was decided therefore to characterize the compound after chlorination

*Preparation of 5 Propyl 7 Chloro 8-Hydroxy Quinoline*—Five-tenths gram 5 propyl 8 hydroxy quinoline was dissolved in 10 cc glacial acetic acid and mixed with 2 cc (a large excess) of sulphuryl chloride The mixture was heated on the steam bath under reflux for one hour It was then poured into water and the milky solution neutralized with ammonium hydroxide The yellow substance obtained weighed 0.43 Gm and was shown by analysis to be a mixture of the mono chloro compound and its hydrochloride It was dissolved in alcoholic hydrochloric acid and precipitated as the hydrochloride by means of anhydrous ether The resulting yellow powder melted at 242° C with decomposition

Analysis Found—Cl 27.52%, calculated for  $C_{11}H_{12}ONCl \cdot HCl$ —Cl 27.52%

The hydrochloride was hydrolyzed by boiling with water and neutralizing with sodium bicarbonate. The base so obtained was analyzed for chlorine.

Analysis Found—Cl 15.97%, calculated for  $C_{11}H_{12}ONCl$ —Cl, 16.03%

*Preparation of the Metho Chloride of 5 Chloro 8 Hydroxy Quinoline*—Four grams 5 chloro 8 hydroxy quinoline were dissolved in 100 cc. nitrobenzene (4) and heated on an oil bath with 4 Gm. dimethyl sulphate for one hour at ca.  $190^{\circ}C$ . No crystals formed on cooling. The nitrobenzene was removed by steam distillation and the aqueous solution distilled to small volume, acidified with hydrochloric acid and saturated with sodium chloride. A precipitate appeared and was redissolved by heating. On cooling the substance crystallized out and was filtered off, redissolved in alcohol and the solution filtered from a small insoluble residue. To the clear solution was added twice its volume of anhydrous ether, precipitating the desired compound.

Yield—2 Gm. of a brilliant yellow substance.

Analysis Found—Cl, 27.55%, calculated for  $C_{10}H_9ONCl_2$ —Cl, 30.85%, for the corresponding methyl sulphate—Cl, 10.35%.

The substance was therefore judged to be a mixture of 83.9% of the metho chloride of 5 chloro 8 hydroxy quinoline and 16.1% of its methyl sulphate.

*Preparation of 8 Diethylaminoethoxy Quinoline Dihydrochloride*—Forty-six hundredths gram of sodium was dissolved in 20 cc. absolute alcohol and 1.45 Gm. 8 hydroxy-quinoline added. The sodium salt which formed did not completely dissolve. Two and six-tenths grams diethylaminoethyl bromide hydrobromide, dissolved in 20 cc. absolute alcohol, were added, effecting complete solution of the sodium salt.

The mixture was refluxed for eight hours and was then filtered off from the separated sodium bromide. The alcohol was distilled off and the dark red residue dissolved in water. It was then made alkaline with dilute caustic soda solution, and an oily emulsion was obtained, which was steam distilled to remove any unreacted diethylaminoethyl bromide. The oil was extracted with ether and dry hydrochloric acid gas was passed into the dry ether extract. A reddish oil separated out. The ether was decanted off, the oily hydrochloride washed once by decantation with ether and dissolved in water. The aqueous solution was boiled with charcoal, filtered and evaporated to dryness. The light yellow oil which remained partially crystallized on standing over night.

Yield—1 Gm.

Analysis Found—Cl 22.62%, calculated for  $C_{15}H_{19}ON_2 \cdot 2HCl$ —Cl, 22.40%.

*Preparation of 5 (Diethylaminoethylamino) 8-Hydroxy Quinoline Dihydrochloride*—Five grams 5-amino 8-hydroxy quinoline was suspended in 20 cc. dry benzene. To this was added a solution of 4.6 Gm. diethylaminoethyl chloride in 10 cc. benzol. The mixture was refluxed on a steam bath for seven hours. The benzene was decanted from the condensation product which had formed a dark viscous mass at the bottom of the flask. The mass was washed twice by decantation with benzol, and after expelling all benzol by heating on the steam-bath was dissolved in water. A dark brown residue, filtered off from the red solution was found to be unreacted 5-amino 8-hydroxy quinoline. The aqueous solution was made alkaline with sodium carbonate, producing a dark somewhat tarry precipitate. After steam distillation, to remove any unreacted diethylaminoethyl chloride it was extracted with ether, the ether solution dried over anhydrous sodium sulphate and treated with charcoal. Dry hydrochloric acid gas was conducted into the light brown solution, throwing down a flocculent brown precipitate, from which the ether was decanted. The residue was washed by decantation with ether, dried and heated at  $100^{\circ}C$  for two hours. The violet colored substance was seen to be crystalline.

Analysis Found—Cl 21.58%, calculated for  $C_{16}H_{21}ON_3 \cdot 2HCl$ —Cl 21.38%.

*Preparation of 5 Carboxy 8 Ethoxy Quinoline by the Skraup Reaction*—Five grams methyl-3-amino 4-ethoxy benzoate were mixed with 7.5 Gm. arsenic pentoxide and 15 Gm. glycerin. Fifteen grams concentrated sulphuric acid were added and the mixture refluxed in an oil-bath for four hours at  $140$ – $150^{\circ}C$ . The dark reaction mixture was cooled and shaken with 60 cc. water. The brown solution was filtered from a dark residue.

The filtrate was nearly neutralized with ammonia, and then treated with a solution of sodium acetate. The greenish precipitate obtained was filtered off and washed with water. It was redissolved in alcohol and treated with 0.5 cc. of concentrated sulphuric acid. On adding four volumes of ether to this solution a brownish gray precipitate of the sulphate of 5 carboxy-8-ethoxy

quinoline was obtained. It was filtered off and washed with ether. The dry substance weighed 1.3 Gm.

The dark residue from the original filtrate was extracted three times with 100 cc portions of boiling 10% sulphuric acid. The three extracts were combined and evaporated to a small volume. The gray crystals which separated and were filtered have not yet been identified. The filtrate from this substance was nearly neutralized with ammonia and precipitated by the addition of sodium acetate solution. The greenish precipitate obtained was isolated, dissolved in alcohol, treated with a little sulphuric acid and precipitated as the sulphate by means of ether. It weighed 1.1 Gm.

The two crops of the sulphate of 5-carboxy-8-ethoxyquinoline, weighing 2.4 Gm, were dissolved in water and purified by shaking with charcoal. After filtering it was treated with sodium acetate and a greenish gray substance was obtained weighing 1.5 Gm, m.p. 285° C. The melting point of the 5-carboxy-8-ethoxyquinoline prepared previously by the method of Matsumura was 292° C. The mixed melting point of the two substances was found to be 292° C.

*Preparation of the Diethylaminoethyl Ester of 5-Carboxy-8-Ethoxyquinoline*—The sodium salt of the acid was first prepared by dissolving 1.8 Gm of the acid in 8.4 cc of normal sodium hydroxide. This solution was evaporated to dryness on the steam bath and taken up in 70 cc of absolute alcohol. After refluxing on the steam bath for two hours almost all of the substance dissolved. To this boiling solution was added 3 Gm of diethylaminoethyl chloride (a large excess) dissolved in 25 cc of absolute alcohol. The refluxing was continued for nine hours and sodium chloride was seen to have separated out. The alcohol was distilled off and the excess of diethylaminoethyl chloride was distilled off in high vacuo on the steam bath. The resulting brown viscous substance was shaken vigorously with water and a silvery gray precipitate was obtained. It was filtered off, washed and dried. It weighed 1.1 Gm and had a m.p. of 76° C. It was redissolved in alcohol and the dark solution was shaken with charcoal. On filtering a clear yellow solution was obtained which on evaporation to dryness gave a grayish white substance melting at 86° C.

Analysis Found—N, 9.44%, calculated for  $C_{15}H_{14}O_3N$ —N 8.86%

It is possible that not all of the diethylaminoethyl chloride had been removed from the viscous material. In view of the small amount on hand, and because of the absence of local anesthetic activity in this substance, the further purification of the compound has not been undertaken.

*Preparation of Anhydro-Mercuri-5-Chloro-8-Hydroxyquinoline*—One and five tenths grams 5-chloro-8-hydroxyquinoline were dissolved on the steam-bath in 20 cc of absolute alcohol. To the solution was added 2.66 Gm of mercuric acetate dissolved in 8 cc of water which had been slightly acidified with acetic acid. An orange precipitate appeared at once. The mixture was refluxed for five hours at the end of which time a test for  $Hg^{++}$  with ammonium sulphide was negative. The orange compound was filtered off and washed with water. It was then boiled with alcohol, filtered off and dried. It was almost completely insoluble in dilute alkali.

Yield—2.1 Gm of an orange powder

Analysis Found—Hg 53.7% calculated for  $C_9H_6ONHgCl$ —Hg 52.9%

*Preparation of Anhydro-Mercuri-5-Nitro-8-Hydroxyquinoline*—This substance was prepared in the same manner as the chloro compound above. It is also an orange powder, only slightly soluble in dilute alkali.

Analysis Found—Hg 49.4% calculated for  $C_9H_4O_3N_2Hg$ —Hg 51.5%

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THE ALKALOIDAL CONTENT OF OREGON-GROWN CYTISUS SCOPARIUS \*<sup>1</sup>BY F A GILFILLAN<sup>2</sup> AND FELIPE PATRICIO LOGAN

*Cytisus scoparius* L., or Scotch broom, has an ancient and honorable medical history. In early times, it spread from its home in the Ural mountains, across northern and western Europe. We find it mentioned in early German and Italian herbals, also in the first Pharmacopœia of London, published in 1618. It was included in all editions of the U S Pharmacopœia from 1840 to 1900 with the exception of the revision of 1850, and it is still listed in the N F. Its chief alkaloid, sparteine, was official in the form of the sulphate in U S P IX. Historically, as the "planta genista" it was worn on the helmet of Geoffrey of Anjou, from whom were descended the "Plantagenet" kings who ruled Great Britain for several hundred years.

Sparteine, the prime alkaloid in the plant, was discovered by Stenhouse (11) in 1851, but the determination of its constitution presented problems which have engaged the attention of organic chemists almost continuously since that time (14, 9, 15, 13, 6). Two other alkaloids, sarothamine and genisteine, were discovered in this plant (10) in 1918, but their amount is negligible. The quantitative determination of the alkaloids of Scotch broom has offered some difficulty. Gravimetric methods have been favored by many investigators (2, 3, 4, 5), however, volumetric methods have been used (1, 7, 8, 12), sometimes with questionable results (5). Seasonal variations in the alkaloidal content of the root of this plant were investigated by Chevalier (3) who found the maximum in March, the minimum in August.

## EXPERIMENTAL

*Indicators for Sparteine*—A N/20 solution of sparteine sulphate, U S P IX was made, using 2.112 Gm. in 100 cc., then 10 cc. aliquots of this were made alkaline with ammonia, extracted with chloroform, filtered and evaporated. The residues which should have consisted of 0.11715 Gm. of sparteine varied in weight from 0.1105 Gm. to 0.1168 Gm. When these residues were titrated in duplicate with the several indicators, the following percentages were obtained, based on the actual weight of each residue used: methyl red (97.22%), hematoxylin (91.96%), cochineal (91.26%), phenolphthalein (67.90%) and bromthymol blue (63.14%).

In order to eliminate errors arising from possible impurities in the original sparteine sulphate or from loss of alkaloid during evaporation of the solvent or from residual ammonia in the titration sample, it was decided to try these indicators using pure sparteine. Into a 500 cc. Claisen flask were placed 173.91 Gm. of sparteine sulphate, a little water and the calculated amount of sodium hydroxide 32.918 Gm. This mixture was distilled under 18 mm. pressure and the liquid alkaloid so obtained, after drying over KOH, was fractionated at 18 mm. pressure. Fraction I (180–183° C.) = 15.39 Gm. Fraction II (183–185° C.) = 23.40 Gm. Fraction III (185–188° C.) = 18.43 Gm. Fraction IV (188–190° C.) = 17.20 Gm. From Fraction III which was assumed to be pure 1.0549 Gm. of the alkaloid was dissolved in a standard solution of N/50 sulphuric acid contained in a 500 cc. volumetric flask and made up to volume. From this were used 25 cc. aliquots in each of which the excess acid was determined, using the different indicators. Three titrations were made with each indicator, the averages being: methyl red (99.64%), hematoxylin (99.22%), cochineal (98.82%), bromthymol blue (98.34%) and phenolphthalein (94.88%).

\* Scientific Section A. Ph. A., Portland meeting, 1935.

<sup>1</sup> Based on a thesis by Felipe Patricio Logan, presented in partial fulfillment of the requirements for the degree of Master of Science at the Oregon State College.

<sup>2</sup> Professor of Pharmacy, Oregon State College.

*Analysis of Crude Drug*—Monthly collections, from January to June, were made of broom tops growing wild near Corvallis. Those growing in the shade were kept separate from those in full sun. All were air-dried and ground, rejecting the larger stems. Two extraction methods were tried using 60% alcohol in one case, and 1% sulphuric acid in the other. With Kg samples of drug results showed a slightly greater efficiency when the acid was used.

Moisture determinations were made on the air dried drug collected each month but the results were without significance. Ash determinations on the same monthly samples showed erratic variations. The alkaloidal content, however, showed a regular seasonal variation. A total of 31 gravimetric and 31 volumetric determinations were made on the 10 samples collected from January to June. The averages of these results based on moisture-free drug, follows

	Gravimetric	Volumetric
January	0.986%	0.980%
February	1.000	0.966
March	1.031	1.026
April	0.907	0.898
May	0.873	0.863
June	1.030 (?)	0.930

Additional samples, growing in full sun and in shade collected in January and in April showed the same results as the composite samples listed above.

#### SUMMARY AND CONCLUSIONS

1. Sparteine is monoacidic to most indicators. Methyl red is quite satisfactory, phenolphthalein invariably gives low results, while hematoxylin, cochineal or bromthymol blue give good results in the absence of interfering impurities.

2. In analyses where extraction is used, volumetric results are apt to be slightly lower than gravimetric, probably due to loss of free alkaloid during volatilization of the solvent.

3. The total alkaloid content of Scotch broom tops, calculated as pure sparteine, reached, between January and June, a maximum of somewhat over 1% in March, declined, and then increased again slightly in June.

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Section Officers and Contributors to the Sections will note the approach of time for the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION

MORPHOLOGICAL STUDIES ON POLYGALA SENEGA \*<sup>1</sup>

BY PAUL D CARPENTER

Senega, the root of a small North American plant, *Polygala Senega* L., enjoyed a very early reputation as one of the new remedies produced by America. It has been official in every edition of the United States Pharmacopœia since 1820. The root is of considerable interest pharmacognostically because of the wide variation evidenced in its secondary development. It has been the object of this work to make a detailed study of this variation histologically, correlating with it certain evident macroscopical irregularities consistently observed in the root.

## THE DRUG

## (A) DESCRIPTION OF THE FRESH ROOT

The fresh roots of Senega are light yellow in color. They may occasionally attain a length of 20 cm. but for the most part they average about 10 to 15 cm. The main root just below the crown soon breaks up into two or more large roots which in turn freely branch producing many fine ramifications.

The main root near the crown is about 1 cm. in diameter in plants of 5 years or more and correspondingly smaller in younger plants.

The roots rarely grow straight but are more or less curved and 'knotty'.

There are two characteristic markings or formations in the fresh root. First, the larger roots are knurled or marked with cross lines. The lines are formed because of regions of lesser and greater diameter in the root which give rise to a series of bulges. They vary in size (longitudinal) from about 1 mm. to 10 mm. They are very pronounced on one side of the root and gradually diminish until on the opposite side they are completely lost which gives rise to the second characteristic marking, a narrow slightly raised and smooth ridge running through the length of the larger roots. This ridge may be quite straight, or it may form in a long spiral around the root. It is at this area a prominent keel forms upon drying.

Transverse sections of the fresh root are usually widely ovate in shape. The keel subsequently appears at the narrow end.

## (B) MACROSCOPICAL DESCRIPTION OF DRUG

The drug occurs nearly entire with some of the larger roots as long as 15 cm. The average length is between 7 and 10 cm. and 2 to 10 mm. in diameter. They are branched and slenderly conical. Most of the smaller roots are broken off either in collecting or in drying and handling. The rather large knotty crowns (2-3 cm. in diameter) are included with the roots. The crown is composed largely of stem bases and numerous rose-tinted or purplish buds which give to the crown, as a whole, a decided rose or purplish color.

The larger roots are often curved and twisted. The twist is long, perhaps 180° or so in a root 10 cm. long. On the larger roots a characteristic raised ridge, running longitudinally and more or less spiral, following the twisting of the root, is frequently developed. It may be more pronounced on some roots than on others although there is some indication of it on all of the larger roots (3 mm. or more in diameter) and occasionally on some of the smaller ones. This ridge is called the keel. The keel forms upon drying and develops along that part of the root free from cross wrinkles (knurls) (Figs 5, 6).

The knurls are less pronounced after drying than before but are nevertheless readily dis-

\* Scientific Section, A. Ph. A., Portland meeting 1935.

<sup>1</sup> Part of a Thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in the Graduate School in the University of Illinois.

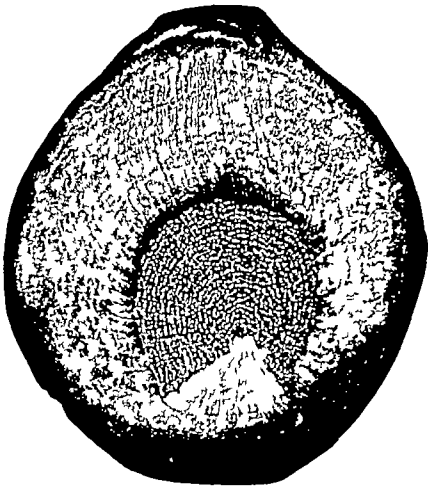


Fig 1 —*Polygala Senega* —Transverse section of the root showing concentric rings in the phloem

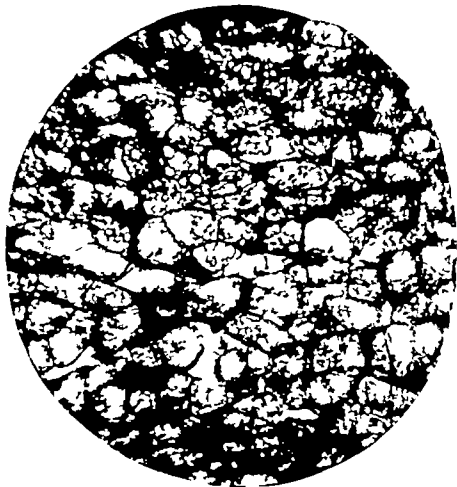


Fig 2 —*Polygala Senega* —Photomicrograph of cortex. Note indication of cell division throughout this region

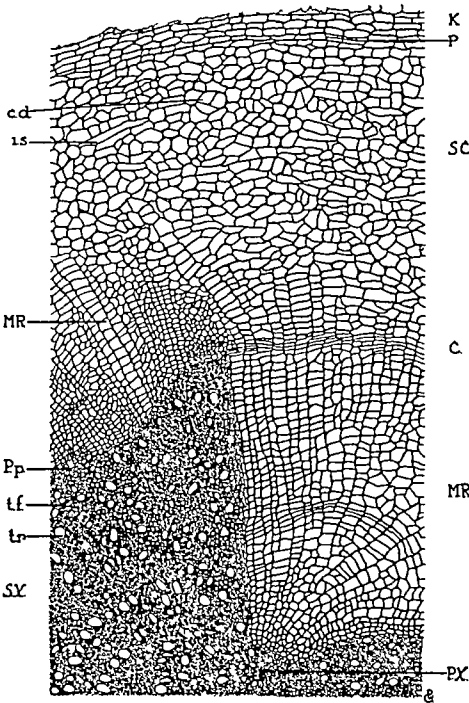


Fig 3 —*Polygala Senega* —Transverse section of the root

- K —cork
- P —phellogen
- cd —cells indicative of cell division
- is —intercellular space

- SC —secondary cortex
- C —cambium
- MR —medullary rays
- MR —medullary ray (board medullary ray of the xylem)
- SC —Pp — phloem patch ' sieve tissue
- tf —fibre tracheids
- tr —tracheal tubes
- SX —secondary xylem
- PX —primary xylem

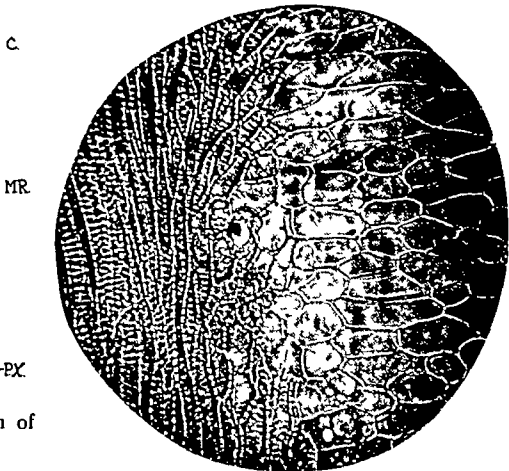


Fig 4 —Photomicrograph of radial longitudinal section through the juncture of the parenchyma wedge and lignified portion of the xylem

tinguishable in the drug Most of the roots develop narrow and shallow longitudinal furrows after drying

The color is brownish yellow, much darker than in the fresh root The fracture is short The drug has a peculiar and penetrating odor and a sweetish taste, afterward becoming acrid In recently dried roots, or in those packed in tightly closed containers, there is a distinct odor of methyl salicylate which, however, disappears upon short exposure to the air

### (c) HISTOLOGICAL STUDIES

1 *Lens View (TS)*—It would be impossible to describe all of the varied formations found in transverse sections of Senega root Even to describe a "typical section" would be difficult, for there are no two alike and sections cut a few microns apart may show extreme differences (Fig 7)

A description of a transverse section follows which in the main is often met with and may, with some flexibility, be called typical and at the same time comments will be made in general (Fig 1)

The bark varies in thickness considerably, from 1 mm at its narrowest point to 2.25 mm, at the widest The xylem is eccentric and 2.3 mm in diameter The lignified tissue is broken by a wide medullary ray, where adjacent to the cambium it is 1.7 mm wide and wedge shaped running to the primary xylem The ray is only 0.8 mm deep, thus the primary xylem is eccentric and more secondary growth is on that side opposite the wide medullary ray In this specimen it is 1.5 mm thick

The bark is easily differentiated into three regions *First*, the cork which in unstained specimens appears as a narrow yellowish brown line, encircling the root In stained specimens it usually takes up more of the stain than any of the other tissues and is then distinctly seen as a very dark line corresponding in color to the stain used

*Second*, the cortex which is a narrow, light yellow region just inside the cork It varies greatly in thickness, being thickest adjacent to the wide medullary ray In this specimen it is 1 mm It becomes gradually diminished in thickness until on the opposite side it may be only a few cells thick and hardly visible in this view There is no apparent differentiation in the cells and the cortex appears homogeneous throughout

*Third*, the phloem is well differentiated from the other bark regions In the unstained specimen, it is of a somewhat darker yellow color than the cortex In stained specimens, both regions stain equally The phloem, however, is easily differentiated after slight magnification because of the regularity of its cells which give rise to two distinct groups of lines *First*, medullary rays can be seen distinctly as fine lines running from the cambium out to the cortex These rays, however, are not all straight, or radial, nor do they form all around the bark if a large medullary ray is present in the xylem as in the section being described There are no rays opposite and adjacent to the cambium directly over the wide parenchyma wedge of the xylem (this ray does not usually continue into the bark as will be shown under the microscopic description) Near the tangential extremities of the wedge, that is away from the middle, short-curved medullary rays are plainly visible in the phloem Farther away and approaching the opposite side of the root, the rays become very much curved and longer until directly opposite the wedge they begin to straighten out and are finally quite radial At this region the phloem is very wide (2.25 mm) It is here the keel forms

The second group of lines seen in the phloem are concentric circles, especially distinct in the thicker regions where in the specimen under discussion there are some 12 to 14 lines The lines closer to the cork are farther apart and they gradually become closer together until near the cambium they are only a fraction of a millimeter apart These concentric circles of the phloem will be further discussed under the microscopic description

### THE XYLEM

It is in the xylem region that extreme variations are seen in the lignified portion As already mentioned the xylem is invariably eccentrically located in the



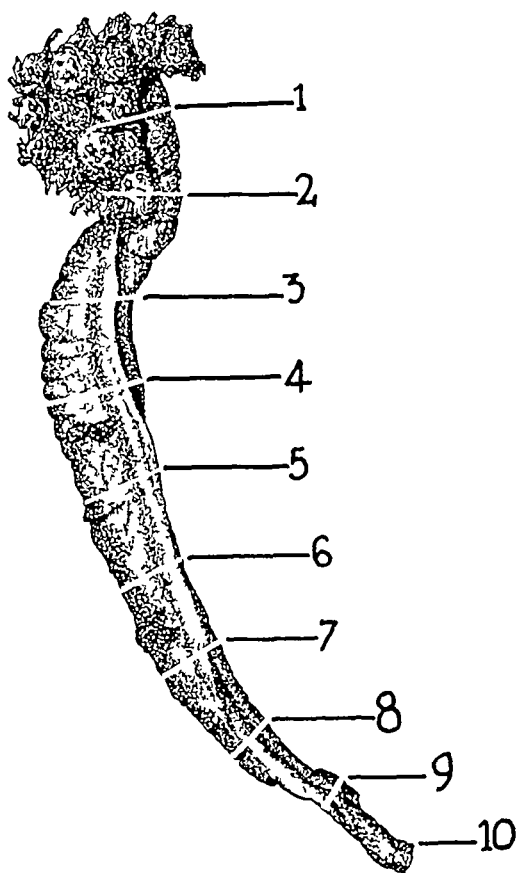


Fig 5—*Polygala Senega*—Root from which transverse sections of Fig 7 were cut at the various regions indicated by numbers 1 to 10

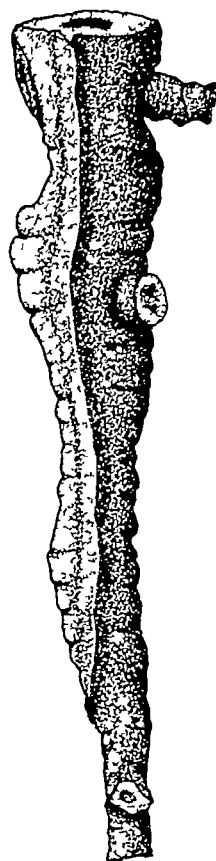


Fig 6—*Polygala Senega*—Root from which model of xylem was made. The length of the root was 5 cm

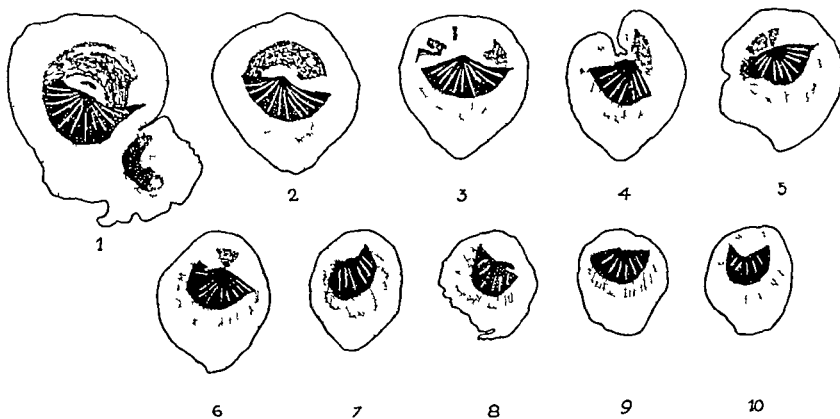


Fig 7—Transverse sections showing variations in the xylem of the root shown in Fig 5 cut at the corresponding numbers

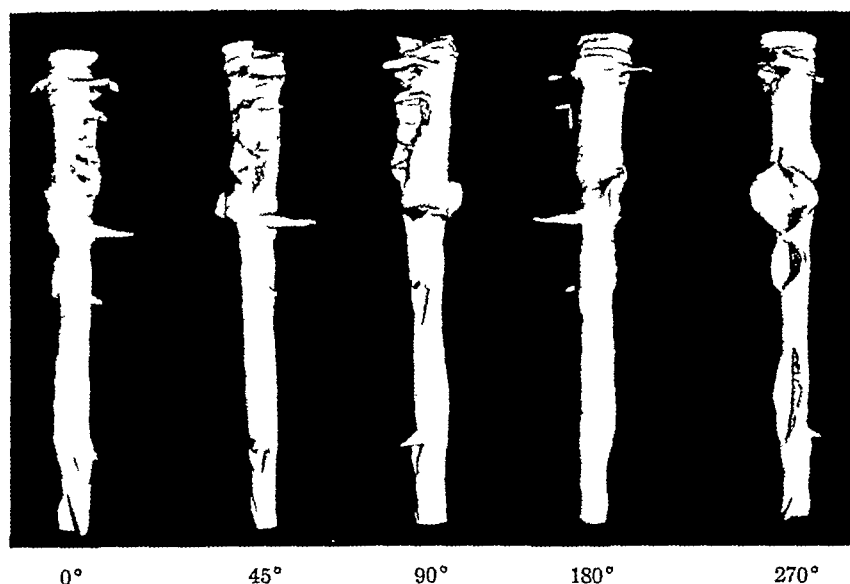


Fig 8—Photographs of model rotated through degrees indicated to show all sides

root and it in itself is eccentrically formed, that is, the primary xylem is seldom in the geometric center. Even when it, as a whole, appears almost circular, it is found to have much more secondary development on one side than on the other. More growth is found on the same side as the greatest development in the phloem, or if a wedge of parenchyma is present on the opposite side to this. The lignified portion may vary from what appears to be a normal xylem (circular in transverse section) to a very small and irregular V-shaped xylem (Fig 7). It is pointed out here that in practically all roots studied, the xylem as a whole is circular in transverse view. By definition the xylem of a root is all tissue "produced by the cambium and found inside of, and surrounded by the cambium." This then takes in the wide areas of parenchyma already referred to as wide medullary rays or parenchyma wedges. In most of the works on Senega, the term xylem has been loosely used to mean only the lignified portion of the entire xylem. Even in sections showing a V-shaped lignified area, the cambium can often be seen to form a circle in transverse section.

The cells of the wide parenchyma wedges of the xylem are in radial rows. By location, by origin, by arrangement of cells, by shape, these wedges of parenchyma are medullary rays definitely belonging to the xylem. The marked variation in the xylem then, is not in it as a whole, but in the lignified portion of it, or which amounts to the same thing, wide variations in the medullary rays of this region. It is, however, convenient to use the term xylem to mean the lignified portion only and it will be used in this way except in specific instances where reference will be made to its more exact usage.

In an unstained specimen the lignified portion of the xylem is of a very pale yellow color almost white in comparison to the bark. The various shapes may readily be observed in even the small roots by cutting transversely and examining the cut surface with a hand lens, or in the larger roots with the unaided eye.

Annual rings may be seen in sections either stained, or unstained at a magnification of about 5 X, showing much better at this magnification than under the higher power of the micro

scope They appear as faint concentric lines especially well, if oblique light falls on the section In the particular specimen used in the discussion so far, there were five such rings apparent, indicating the root is six years old Very fine but distinctly seen radial lines, some straight some slightly curved are seen as narrow medullary rays in the xylem There were about twenty four in this specimen (they are more prominent toward the outer half of the xylem) The radial arrangement of the cells in the wide medullary ray can be plainly seen, especially in contrast to the cortical cells farther out

2 *Microscopical Description The Bark—the Cork*—The cork layer of Senega root is relatively thin, seldom over 4 or 5 cells thick except in an occasional area of wound cork where it is thicker (10–20 cells) and in a few instances it has been noted that these cells are lignified

In transverse section the cork cells appear oval to rectangular for the most part, but as this region approaches that portion of the root opposite the wide medullary ray the cells tend to become more and more isodiametric and often appear almost round in this view

The average size of the cork cells in transverse section is about 60 microns (tangential diameter) by 20 microns (radial diameter) although there is considerable variation from these sizes especially in the tangential diameter The cell wall is quite thin (1–2 microns) with only slight variations in thickness In longitudinal radial view the cells appear more square and average about  $20 \times 30$  microns with the radial diameter shorter than the tangential In longitudinal tangential (surface) view the average size is  $20 \times 60$  microns, the cells being elongated tangentially The middle lamella is not apparent in any of the sections

The cork cells of Senega root do not form in the characteristic radial rows usually observed in most dicotyl corks The cork appears rather as a layer of suberized parenchyma Very often the outermost layer of cells (whole cells) shows protoplasts again suggesting a resemblance to parenchyma The cell walls are a light yellow color, the outer wall of the outermost cells slightly darker There are partially disintegrated or decayed cells similar to the cork cells adhering as uneven broken fragments on the outer surface Possibly these are old primary cells but because of their close resemblance to the cork cells just described they are probably of the same tissue

*Phellogen*—Evidence of a phellogen is only occasionally seen even in very young roots Many sections show none at all Now and then however a single cell just below the cork appears to be a meristematic cell Occasionally 3–6 such cells have been observed in a tangential row The absence of a well developed phellogen is not surprising however since there are (even in a 5 year old root) only 3–5 rows of cork cells The phellogen cells as seen now and then are in transverse section about 8 microns (radial diameter) by 20 to 40 microns (tangential diameter)

*Secondary Cortex*—The secondary cortex is made up entirely of living parenchyma cells which are filled with a substance globular in shape, varying in size and being oil-like in appearance

These cells immediately below the cork are narrow and elongated tangentially In transverse view they are about  $15 \times 60$  microns This type of cell comprises the first 4–6 rows of the outer cells Sometimes they gradually widen until they become nearly isodiametric or only slightly tangentially elongated or they may remain about the same size and a sudden change in size and shape is then seen in the parenchyma lying adjacent to this narrow zone of cells The cell walls at this juncture are very often much thicker than at any other place in the cortex The author has seen them as thick as 12 microns especially at the corners The average wall thickness of the cortical parenchyma is 2–4 microns

The cells making up the rest of the cortex are more or less isodiametric in transverse section, although they are as a whole slightly elongated tangentially The cells in this region show no evidence of radial rows which one might expect if their origin was entirely from a secondary meristem In the reporter's opinion this is because cell division takes place throughout the entire cortex during the life of the plant With properly stained specimens many cells distinctly show evidence of recent cell division (Fig. 2) Often after staining, a cell that first appeared as a single cell will show 2 nuclei and a very thin protoplasmic wall separating the 2 new cells Others show a cellulose wall extremely thin while still others show walls of varying thickness up to the maximum for this tissue Mitotic figures have been seen in occasional cells

## PHLOEM

The phloem is for the most part made up of parenchyma in radial rows. There is considerable variation in the size and shape of the cells, sieve is confined almost entirely to the inner half adjacent to the cambium and found in small isolated patches (Fig 3). As described under the lens view, the region almost always shows more development on one side of the root than the other. The various differences are described in the cellular structure of the phloem working through the thicker portion from the cortex to the cambium and using the same specimen as in the lens view as a type. The phloem at its widest point runs to within 6 or 10 cells of the cork. It is not difficult to definitely see where the phloem and cortex join because of the regular radial arrangement of phloem cells in contrast to the irregularity of the cortical cells. This juncture is not even however, some medullary rays running farther in the cortex some less.

There are two groups of cells which form nearly concentric bands in the phloem alternating with each other and gradually becoming closer together until when rather near the cambium they are only a few cells apart.

The parenchyma cells of the phloem in transverse section vary from 5 to 50 microns in diameter. The larger ones are closer to the cortex and gradually diminish in size until near the cambium they are extremely small. It is in this portion of the phloem that sieve tissue is found in small isolated patches.

The parenchyma varies in shape from isodiametric to rectangular cells. Invariably the elongation is in the tangential diameter. The isodiametric cells form bands in the phloem. The bands are from 2 to 8 cells wide and alternate with similar bands of the tangentially elongated cells. These give rise to the concentric lines seen in the lens view. The isodiametric cells average, in the outer portions of the phloem, about 35 microns. The cell walls are about 4 microns thick, showing only slight variations in thickness and composed of cellulose. Occasional simple pores are seen on all walls. The middle lamella often stands out very distinctly especially in stained specimens in which case it takes up more of the stain than the thickened portions. The phloem parenchyma shows the same cell contents as the cortical cells.

The bands of tangentially elongated cells are not as wide as those composed of the parenchyma just described. Usually there are fewer cells in the ring and the radial diameter is considerably less. This type of cell averages in transverse section 35 by 10 microns. The cells do not break up the radial rows because their tangential diameter is the same as that of larger cells. The walls are somewhat thicker (5 to 6 microns). The bands closer to the cambium consist of smaller cells although in radial number they remain about the same.

It will be seen from the foregoing description that the wide portion of the phloem is made up of two distinct types of parenchyma cells giving rise to alternating bands of tissue having different physical characteristics. This arrangement is referred to again under the discussion of the keel.

The sieve tissue in transverse section is seen in small patches close to the cambium and sometimes out to about the middle of the phloem, seldom farther. Each patch is made up of about 15 to 20 cells. The average sieve cell is 15 microns in diameter and isodiametric in transverse section. Associated with the sieve cells are smaller cells (companion cells) about 7 microns in diameter. The sieve patches appear to be made up of cells with rather thick cell walls. This however, is only relative and due to the small size of the lumen. The cell walls are about 3 microns thick which is often slightly thicker than the walls of the surrounding parenchyma. This frequently causes the sieve patch to be more refractive and stands out from the other tissues more pronouncedly.

Adjacent to the parenchyma wedge of the xylem the phloem may be entirely wanting or consist of a few cells in radial rows forming a continuation of the medullary ray through the cambium and into the bark for perhaps 5 to 10 cells. Opposite the middle portion of the ray there is less likely to be phloem tissue present while near the juncture of the ray and lignified portion of the xylem, the phloem is definitely present (Fig 3).

The author has never seen sieve tissue in the phloem directly adjacent to the wide medullary ray of the xylem. If the lignified portion of the xylem is circular in transverse section and especially if the primary xylem is nearly centric the phloem is quite normal in its development and forms completely around the xylem.

If the primary xylem is markedly eccentric, the phloem is also eccentric and forms about the same way as when the large parenchyma wedge is present

*Longitudinal Section of the Cortex and Phloem—Cortex*—The cells in the cortex, in either radial longitudinal section or tangential longitudinal section, show little difference in appearance from the transverse section already described. The cells are for the most part isodiametric. The cells near the cork which are tangentially elongated in transverse section are almost circular in the radial longitudinal section and elongated in tangential longitudinal section. They are therefore similar in arrangement and somewhat in size and shape to the cork cells. There is one noticeable difference in the size of the cortical cells which it is believed is significant and accounts for the peculiar rings or knurls seen in the fresh root and to some extent in the dried root. The cells at the narrowest diameter of the root, that is between or separating the bulged portions, are appreciably smaller than those found in the region of greater diameter. They are often more radially elongated also. Assuming that the cells in a given longitudinal plane all originate at about the same time, it can readily be seen that if a certain portion of the cells increase greatly in size and another portion only slightly, the surface area will be increased unequally and thus in turn will cause a bulging where the greater increase in the size of the individual cells has taken place. As stated under the description of the root, the knurls do not run all the way around the root. There are none where the keel forms. The microscopic examination shows little or no cortex at this region and the cells are about equal in their development. The knurls in size (thickness) follow well the thickness of the cortex, as the cortex narrows down so do the knurls correspondingly decrease.

Often oblique bands of elongated cells are seen in the longitudinal sections which appear to be part of the cortex but are probably phloem cells of a lateral root. It is believed that in many cases the lateral roots leave the main root in a long curve rather than making a sharp turn. This would account for the fact that after selecting a small portion of root free from lateral roots on the surface, there still appears strong evidence of their presence in the various microscopic sections.

*Phloem—Longitudinal Section—Radial*—All of the cells of the phloem are very much elongated. They average about 150 microns. Some will occasionally attain a length of 250 microns. The end walls of a radial row of cells are usually in the same plane and if a cut is made as nearly radial as possible, these end walls form almost a straight line across the field of view. If the cut is not radial or varies only slightly from it, the lines are lost because the end walls are not found in the same plane in tangential rows of cells.

The sieve cells are not easily differentiated in the longitudinal view. Being only 5 to 10 microns in diameter, they appear as long lines of cell wall material and can hardly be distinguished from the narrow parenchyma surrounding them. Occasional cells nearer the cambium are free from the characteristic oil-like cell contents and these are undoubtedly the sieve cells. The smaller companion cells seen in the transverse section are extremely difficult to observe in the longitudinal view.

The same bands of cells seen in the transverse section are also plainly visible in the radial longitudinal section. Those with the thicker walls are narrower and more highly refractive to light. In many of these cells the end walls are slightly thicker than the lateral walls.

In the bands made up of the larger cells, the only noticeable difference besides their size is that in many cases, especially those nearer to the cortex, the end walls are more oblique or rounded, often giving the individual cells a cigar-like shape. Small intercellular spaces are seen at the juncture of such cells.

*Longitudinal Tangential Section*—Since the tangential diameter of the phloem cells varies only slightly except that the diameter gradually becomes less toward the cambium, there is no marked difference in the appearance of the cells in a single section. In comparison to the radial view, however, there are besides the uniformity of the cells two noticeable differences. *First*, the end walls do not fall in the same plane and the tissue appears as a network of elongated cells. *Second*, the end walls are not straight across, that is, at right angles to the long axis of the cells but are oblique and often rounded. The end walls of the parenchyma of the phloem are therefore wedge shaped. Sections near the xylem show cells very difficult to differentiate because of their narrow diameter and relatively thick walls and appear more as a mass of lines, the end walls being indistinct.

3 *Cambium*—The cambium forms a complete circle around the xylem. It is much more

distinct adjacent to the wide parenchyma wedges of the xylem where it often forms a rather wide zone (Fig 3, C) In specimens that have been dried and subsequently softened it is seldom seen except at this region In fresh material, especially if collected during the growing season it may be seen adjacent to the lignified portion but differs from that over the ray in that it seldom forms a "zone" but is only one cell wide for the most part The cambium cells correspond in tangential diameter to the tissues lying adjacent to it (Fig 3) The radial width is from 3 to 6 microns The nucleus and the rest of the protoplast are very prominent Iodine stain often brings out the cambium ring more pronouncedly because of the dense protoplasmic content

4 *Xylem (Transverse, Tangential, Radial)*—The xylem may conveniently be divided into two parts the lignified portion and the non lignified portion The former consists of tracheal tubes, wood fibres (fibre tracheids) and the narrow lignified medullary rays The latter consists entirely of parenchyma and has been referred to several times before as the parenchyma wedge or wide medullary ray

*Transverse Section*—The elements of the lignified portion are first described in the order named

*Tracheal Tubes*—The tracheal tubes are oval to circular, a few showing more or less straight sides and are therefore somewhat angular Most of them, however, are only slightly oval, the greater diameter being radial They vary in diameter from 20 to 50 microns Most of them average 40 microns the larger and smaller being less frequent Those of the primary xylem, which are plainly visible in all roots are 5 to 15 microns in diameter

The common cell wall, between either two tracheal tubes or between a tracheal tube and fibre, show slight variations, the average thickness being from 5 to 7 microns Pores of a very peculiar formation are seen in the wall of the tracheal tubes They appear as a chain of elongated small intercellular spaces about 5 microns long and 1 to 2 microns wide

The tracheal tubes seldom occur in groups of more than two or three and are for the most part separated from each other by a few fibres or medullary ray cells In a low power view the tracheal tubes can be seen to form in rather obscure tangential rows, more pronounced near rings of growth which are for the most part made up of fibres

*Wood Fibres or Fibre Tracheids*—The fibres are quite angular in this view varying from almost square to triangular to several sided They vary in size from 5 to 18 microns The thickness of the common cell wall between two fibres is about the same as that between the tracheal tubes and fibres 5 to 7 microns It is possible that as a whole the thickness is very slightly less between the fibres The same type of pores is found in the walls of the fibres as those described in the tracheal tubes

The fibres generally are elongated somewhat in their tangential diameter This is especially noticeable when they occur in radial rows of 4 or 5 cells as they do in the annual rings Generally there are only 1 to 3 fibres separating the tracheal tubes from each other

The middle lamella stands out rather distinctly in unstained specimens, being more refractive than the secondary wall thickening In stained specimens it takes up more of the stain

*The Medullary Rays of the Lignified Portion of the Xylem*—It is very difficult to distinguish between the fibres and medullary ray cells in the transverse view The walls of both are lignified and are the same thickness and the cells are about the same size and shape However, close observations under the high powers of the microscope will differentiate them In general the medullary ray cells are radially elongated It must be borne in mind that occasionally the fibres are also radially elongated or isodiametric Also, sometimes a few medullary ray cells will be tangentially elongated or isodiametric

In fresh material the medullary ray cells often show the characteristic cell contents of the bark parenchyma This is not so easily seen in material that has been dried and later softened with water, nor is it seen in material which has been kept for some time in strong alcoholic solutions The most constant and perhaps surest way to distinguish these cells from the fibres is by the type of pores found in their walls The pores of the medullary ray cells are simple and in transverse view show the typical picture of this common type of pore, the middle lamella being free from secondary thickening for a short distance They are about 1 to 3 microns in diameter and occur less frequently than do the pores of either the fibres or tracheal tubes

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invariably produces several layers of fibres almost always free from tracheal tubes and in all the observations made, entirely free from medullary rays (Fig 3, P X)

*The Wide Parenchyma Wedge or Medullary Ray of the Xylem*—This type of ray is of course not always present in the transverse section of the root. About five of the sections cut (which totaled some 2000) were free from such non lignified rays. Two or more may be seen in some sections. The individual cells of the unlignified xylem rays resemble very closely the parenchyma cells of the phloem rays, perhaps somewhat larger especially near the cambium. The cells form in remarkably straight radial rows (Fig 3). They show considerable variation in size. Those nearer the center of the root are much smaller than those nearer the cambium. They gradually increase in size from about 8 microns to 40 microns. Those cells adjacent to the lignified cells show much less increase in size and remain throughout the length of the ray about the same size as the bordering lignified cells. Sometimes they also exhibit partially lignified walls (Fig 4).

Occasionally a band of tangentially elongated parenchyma is seen to run through the ray. In the author's opinion this is formed as an annual ring because it is usually continuous with such a ring in the lignified portion of the xylem. The formation of rings in this region is, however, by no means constant (Fig 3, M R).

The same cell content as found in the bark is also found in the parenchyma of the ray.

*Longitudinal Tangential Section—Tracheal Tubes*—The tracheal tubes are made up of segments, or units of about 160 microns long, although there is considerable variation from this. Many are much shorter. Occasionally one is seen that is no longer than it is wide. The end walls are only partially dissolved out so that the diameter of the opening between segments is less than the diameter of the tracheal tubes away from the ends. The end walls, or rather the portion remaining, is readily seen in radial view, and it is often impossible in the view to tell that only a portion of it has dissolved out. They are oblique forming rather sharp angles with the side walls and one segment dovetails with the section directly above or below.

The pores of the tracheal tubes in this view are long and slit-like running very nearly at right angles to the long axis of the cell. The pores vary in size and give rise to two distinct types of markings, those with very narrow openings 1 micron or less, and those with wider pores, 2 to 3 microns which because of their length (5 to 10 microns) and closeness to each other, give rise to the typical reticulate form of tube. The pores are 3 to 6 microns apart and about equally distributed throughout the walls. It is because of their closeness to each other that they appear in the transverse section as a string of small openings in the walls. Although the sections may be very thin, they are usually greater than the longitudinal diameter of the pore.

*Longitudinal Radial Section—Fibres*—The wood fibres are elongated tapering cells whose end walls dovetail together. They average about 225 microns long. The pores of the fibres are also slit like but much shorter than those of the tracheal tubes. They differ also in that they are oblique and a shadow forming the so called border is more distinctly seen around the pores of this tissue than those of the tracheal tubes. Often only a single row of pores is seen along one surface of the fibre. Their maximum length is about 3 microns and their width 2 microns or less. They occur in the walls about as frequently as those of the tracheal tubes (Fig 4).

*Longitudinal Tangential Section—the Lignified Medullary Rays of the Xylem*—It is in this view that the lignified medullary rays are most easily recognized. The cells are longitudinally elongated and resemble in general very short wood fibres. Most of the cells have tapering end walls but frequently the side walls show some tapering and the end walls form at right angles to these. The average length of the cells is about 60 microns but here again much variation is often seen. An isodiametric cell is not uncommon. In length they may approach the fibres.

The one factor that remains constant is the less frequent occurrence of pores in the walls. Often in this view an entire radial wall may not show a single pore. This is not due to the fact that there are actually a far less number of pores in the medullary ray cells, but due almost entirely to their very small size. The pores are only slightly elongated and are 2 microns, or less, in diameter, so although their centers may be about the same distance apart as the centers of the longer and larger pores of fibres and tracheal tubes, they are cut less frequently in sectioning, hence the apparent absence of pores on large portions of the walls.

On the tangential wall the pores appear as small bordered elongated dots. They are on the average about 6 microns apart.

The medullary rays vary in height from a few cells to many hundreds of cells, often being several millimeters long. Their width is seldom over 5 cells.

*Longitudinal Tangential Section—the Wide Parenchyma Ray*—The parenchyma are essentially alike in this view. The cells are isodiametric and corresponding in size to their tangential diameter as seen in the transverse view. The cells of the sections cut closer to the cambium are larger than those farther in toward the center of the root. The cells do not occur in rows but rather form a network.

*Longitudinal Radial Section*—The radial longitudinal section simulates the tangential longitudinal section in most respects. The following differences may be observed—medullary rays are rarely seen for their entire depth—visible portions of them show cells slightly radially elongated. The markings appear similar to those described in the longitudinal section. tangential view

In radial section the junctures of a large number of tracheal tubes appear obliquely circular. In contradistinction to this these same junctures in tangential section appear as oblique lines. The end walls, therefore, before being dissolved out, lie for the most part obliquely in a tangential direction.

5 *Primary Root*—The primary roots show a very simple and normal development. They are very small, almost hair like, and the average primary root is 0.3 to 0.5 mm. in diameter.

The epidermis consists of oval-shaped cells in transverse section, the longer diameter being tangential. The average tangential diameter is about 18 microns and the radial 10 to 12 microns. The cell walls are about 2 microns thick, except the outer, which is thicker because of a cuticle 1 micron or so thick. Only occasional root hairs are seen.

The primary cortex is relatively large and is made up of rather large parenchyma. The entire cortex, however, is only 4 to 5 cells wide. The outer half consists of one or two rows of cells about 35 by 30 microns tangentially elongated. The next row of cells is usually somewhat larger and radially elongated, about 35 by 40 microns. Next to these, a circle of smaller cells 18 by 12 microns is easily recognized because of the sharp contrast in size with the cortical cells. This is the endodermis. The cell walls are hardly thicker than the cortical parenchyma.

The radial fibrovascular bundle is a diarch. The xylem is made up entirely of tracheæ, of which there are about 15. They are 5 to 15 microns in diameter. The two phloem patches on either side of the row of tracheæ consist of a few very small sieve tubes (15 to 20 cells). Occasionally larger parenchyma cells are also found in this region. The average sieve cell is about 6 microns in diameter in transverse section. These roots very soon become secondary and give rise to roots which at first appear to be normal, but very soon the eccentric xylem becomes apparent which is always the result of secondary growth in Senega root.

#### (d) DISCUSSION OF SOME OF THE ABNORMAL DEVELOPMENTS EXHIBITED BY SENEGA ROOT

In order to study the abnormal development in the xylem a model of the lignified portion was built. A typical root 5 cm. long was cut into 1135 consecutive sections, each mounted in glycerin jelly, and each in proper order and orientation with respect to the original root. With the aid of a camera lucida the lignified portion of the xylem of each section was drawn at a magnification of about 15 X onto cardboard. Each drawing was then cut out and numbered. The cardboards thus represented, to a fair degree, magnified sections of the xylem. They were then glued together in proper order one after another. To insure proper alignment in building up the model, a straight longitudinal cut was made through the bark of the original root before the sections were cut. Then, in drawing the outlines of the xylem, a ruler was placed parallel with this cut and a line drawn across the xylem

With careful attention these lines were made to fall directly over each other in gluing the sections together. After all the sections were thus built up, a thin layer of plastic paint was spread over the surface to smooth out the slight ridges unavoidably formed by the layers of cardboard. The whole was then painted pale yellow, the natural color of the xylem (Fig 8)

Several interesting observations may be made from the model. Although it is invariably stated that the keel forms opposite the wide medullary rays only, it will readily be seen by comparison with the original root (Fig 6) this is not always true, for if it were true, in the particular specimen the keel should be markedly spiral at some parts of the root and entirely absent at others. It is on the contrary quite linear and uniform in size and shape.

At the outer portion of the medullary ray wedge, the lignified xylem exhibits a distinct flare, the edges of which often extend beyond the normal limit of the xylem cylinder.

It is also interesting to note that a rather wide but short medullary ray is formed immediately below each root branch. In cutting many other specimens, this condition has been found to be quite constant in Senega root.

It can also be readily understood why sections of the same root, cut rather close to each other, present such marked and widely different formations in the xylem. It is not unusual to cut transverse sections 1 mm, or less, apart and find in one section a normal circular xylem and in others a xylem, semicircular, or even V-shaped.

Perhaps the most interesting abnormal development in Senega root is the development of the keel upon drying. The literature I have been able to review has not adequately explained nor offered a satisfactory theory as to how the keel is formed. The following is offered as a physical explanation of their formation.

If one were to imagine a small piece of apparatus built from strips of metal and a block of wood in a manner to be described, it would be possible to observe a similarity in the physical make-up of it and the phloem of Senega root. If several strips of metal of varying lengths were securely fastened to a block of wood in such a way as to cause the strips to form in wide ellipses as indicated in Fig 9, one could

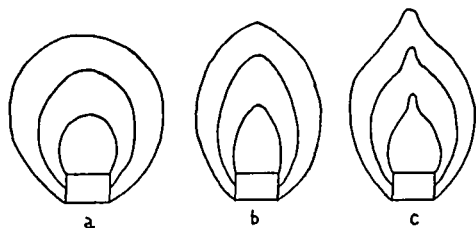


Fig 9—Diagram of apparatus to illustrate formation of keel

imagine these to represent the bands of radially narrow and thicker walled cells described under the microscopic description of the phloem. Now if a tenacious and adhesive material, which would shrink upon drying, were filled in between these bands, it would not be difficult to see that forces would result which in turn would cause a sharper bow to take place in the strips of metal (which resist any change in length) at their greatest diameter (Fig 9a, b and c). This would appear as a ridge when viewed from the side. The adhesive material corresponds to the bands of larger and thinner walled cells of the phloem.

While the bands of cells do not by any means simulate the actual physical properties of the metal and adhesive material, their behavior upon drying, due to

their arrangement and cell characteristics, must correspond somewhat to the imaginary piece of apparatus

In other words, there are in the phloem two sets of alternating bands, one composed of larger and thinner walled cells, which will shrink more upon drying than the second set, composed of narrow tangentially elongated and thicker walled cells which will resist shrinking and will, therefore, be subjected to the pull of the cells of the first set and as with the metal, a ridge will result

The bands are more pronounced in some roots than in others, some showing practically no trace of them Likewise, some roots form prominent keels, others do not

In concluding the author wishes to acknowledge the many valuable suggestions given by Professor E H Wirth of the Department of Pharmacognosy during the progress of this work

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## THE HISTOLOGY OF CRACCA VIRGINIANA LINNÉ ROOT \*,<sup>1</sup>

BY B V CHRISTENSEN<sup>2</sup> AND ELBERT VOSS

*Cracca virginiana*, Linné, root (Leguminosæ—devil's shoestring, goat's rue, catgut, etc) has recently come into special prominence following the discovery of its insecticidal properties by Little (1), and the isolation of rotenone and tephrosin from the root by Clark (2) The fact that commercial samples of rotenone are at present limited to foreign sources, being obtained only from derris and cube roots, makes it highly desirable to develop a native source yielding an abundance of this insecticidal material The United States Department of Agriculture, Bureau of Plant Industry, is at present making an extended study of *Cracca virginiana* root, with the hope of finding varieties of it which may be of insecticidal value or of value as commercial sources of rotenone Many samples have been collected by the author from the Southeastern United States, and others in other sections, and sent to the department for tests of their insecticidal value and rotenone-yielding qualities Through these tests there is being accumulated a large amount of information as to localities, soil types and varieties of the root yielding the best quality of crude drug

Should the findings of the Department of Agriculture confirm the hope that *Cracca virginiana* root offers an American source for the valuable chemical, rotenone, it will be desirable to know its essential histological characteristics and the histological characteristics of related species in order that they may be differentiated The object of the present work is to present the histological and morphological characteristics of *Cracca virginiana* root, along with the histological and morphological characteristics of closely related species of *Cracca* available in this locality

In addition to the histological and morphological characteristics there are

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\* Scientific Section A Ph A, Portland meeting, 1935

<sup>1</sup> From an abstract of a dissertation presented in partial fulfilment of the requirements for the degree of doctor of philosophy at the University of Florida School of Pharmacy, Gainesville Florida, June 1935

<sup>2</sup> Director of the School of Pharmacy, Head of Department of Pharmacognosy and Pharmacology, University of Florida

2 Fewer vessels and associated tracheids in *Cracca latidens* root, the central region is distinctly less vascular, while in the intermediate areas of the xylem no groups of vessels were found to number more than four

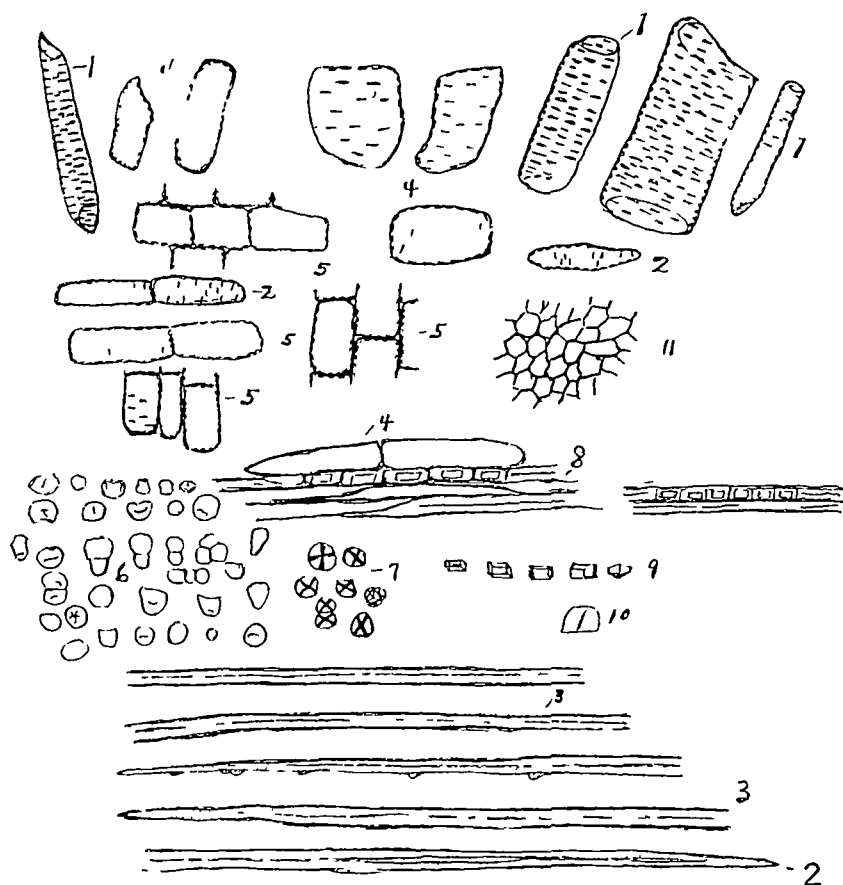


Fig 3 —Powder and isolated tissues of *Cracca virginiana* root 1 Vessels, 2, tracheids, 3 sclerenchyma fibres, 4 parenchyma cells, 5, medullary rays 6 starch grains, 7 starch under polarizer, 8 crystal fibres, 9 crystals, 10 inulin, 11, cork

3 More bast fibres in the cortical parenchyma region, groups containing as many as 20 fibres are frequently observed

4 No calcium oxalate in *Cracca latidens* root

#### CRACCA AMBIGIRA

1 The roots are fleshy 10 to 12 inches in length, and about  $\frac{1}{2}$  cm in thickness and contain few secondary roots They are grayish white externally and whitish internally, the powder is of a grayish white color

2 The xylem areas are less vascular in the central and intermediate regions but distinctly more vascular in the outer regions The side walls of the vessels contain more numerous transverse markings

3 The arrangement of tissues in the xylem areas differs further in that groups of parenchyma cells occur between compact groups of wood fibres and between the wood fibres and vascular tissues

4 Numerous cells in the cortical parenchyma region and occasional ones in the xylem areas have a resinous content, solitary crystals of calcium oxalate are also more frequent

5 Sclerenchyma fibres are less numerous in the powder, with a correspondingly greater amount of parenchyma and starch The side walls of the parenchyma and medullary ray cells are more distinctly pitted

6 Compound starch grains are more frequent and large aggregates of starch are also numerous, the simple grains are smaller, averaging from 6 to 10 microns in diameter

#### CRACCA HISPIDULA

1 The root is slightly fleshy, from 6 to 10 inches in length and about  $\frac{1}{2}$  cm in thickness, and bears few secondary roots Externally it is a grayish brown color and internally a faint grayish yellow color

2 Central regions of this root vary considerable in structure Some sections present large thin walled parenchyma cells and a few vessels surrounded by tracheids others contain a larger number of vessels in association with many tracheids and a few wood fibres and contain very few parenchyma cells There are various gradations of structure between these two extremes Vessels are fewer in the intermediate areas, but more numerous in the outer xylem areas

3 Groups of parenchyma cells occur between compact groups of wood fibres and between the wood fibres and vascular areas

4 Sclerenchyma fibres are less numerous in the powder with a correspondingly greater amount of parenchyma and starch

5 In addition to di and tri compound starch grains, small aggregates of starch are rather frequent The simple grains average about 10 microns in diameter, with occasional ones up to 15 or 20 microns

6 The medullary rays are up to six cells in width, and average from 1.5 to 2 millimeters in height

#### CRACCA SPICATA

1 The root is slightly fleshy, from 6 to 10 inches in length and contains few secondary roots The color externally is grayish, internally whitish gray, the powder is of a grayish brown color

2 Large groups of bast fibres in the cortex, these number up to 35 or 40 fibres, the average number being about 15 or 20 The lumen of the bast fibres is relatively large, elliptic, ovoid or elongated in outline, individual fibres are only slightly lignified

3 Vascular elements are relatively much less numerous From 6 to 12 large vessels and associated tracheids are found in the central region and the vessels are also much less frequent in the intermediate and outer regions

4 The arrangement of tissues in the xylem areas differs further in that groups of parenchyma cells occur between compact groups of wood fibres and between the wood fibres and vascular areas

5 The medullary rays are up to five cells in width The individual cells are not lignified and have smooth walls

6 The powder contains a greater amount of parenchyma and starch The walls of the parenchyma cells are smooth

7 Practically all starch grains are simple, a few are di compound The simple grains are up to 20 microns in diameter the average being about 12 microns

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# A STUDY ON THE WASHING OF MILK OF MAGNESIA THROUGH A PERMEABLE MEMBRANE \*

BY E. MONESS, W. A. LOTT AND W. G. CHRISTIANSEN <sup>1</sup>

Milk of Magnesia is usually prepared by precipitating magnesium hydroxide from a solution of magnesium sulphate by means of sodium hydroxide. The sodium sulphate resulting from this double decomposition, along with any excess sodium hydroxide must be removed from the magma, or suspension of hydrated magnesium hydroxide. This removal of electrolytic impurities from the milk of magnesia, technically called "washing" the milk of magnesia, is usually not carried out by filtration methods in view of the adverse effect upon the stability of the suspension which seems to accompany any thickening of the milk of magnesia to the extent necessary in that procedure <sup>2</sup>. The degree of thickening which occurs during the settling of the suspension in decantation methods of washing does not seem to be detrimental to the subsequent stability of the product, and decantation methods in some form or another are therefore in fairly general use.

The decantation method involves, however, some very important disadvantages. The rate of settling is very slow even when the temperature is maintained well above that of the room in order to hasten it. Due to this required temperature maintenance and to the long periods of time required for settling between each decantation, the method does not lend itself to the economy in water that could accrue through using, in the earlier stages of the washing of any particular batch, water which has already been used for the later stages of the washing of previous batches.

Without considering, for the moment, any technical questions of handling in plant practice, it seemed that these difficulties could be obviated in a method whereby the milk of magnesia is washed by means of wash water separated from it by a permeable membrane. It was to be expected that the diffusion of electrolyte through that membrane would require much less time than that required by the repeated settlings.

In taking up a theoretical consideration of the problem of washing milk of magnesia by means of the diffusion of the electrolyte through a permeable membrane into the wash water on the opposite side of that membrane, it will be seen that Fick's Law will require some alteration.

Thus Fick's Law states that the amount of solute  $dS$  which will cross a given cross sectional area " $a$ " in time  $dt$ , is expressed by

$$\frac{dS}{dt} = -Da \frac{\delta_0}{\delta x}$$

\* Section on Practical Pharmacy and Dispensing. A. Ph. A. Portland meeting 1935.

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<sup>2</sup> We have at present no experimental basis for a theoretical discussion of the factors which determine the stability, or other physical characteristics of the milk of magnesia. Based upon general theory and analogy with colloidal hydrous oxides which have been more closely studied we have assumed the colloidal character of milk of magnesia to be  $[MgO](H_2O)_x$  and that any mechanism which will bring about a decrease in the value of  $x$  will cause the stability of the suspension to be decreased.

when  $\frac{\delta c}{\delta x}$  is the concentration gradient in the direction of  $x$  and when  $D$  is the so called diffusion constant or specific diffusion rate for the solute in question

Under the conditions of our proposed experiment there will be the additional circumstance that free diffusion of the solute will be impeded by the permeable membrane. This impedance factor would be a constant characteristic of the chemical nature, physical texture and thickness of the membrane. Therefore the value of  $D$  would be altered by the constant factor  $K$

$$\frac{dS}{dt} = -K Da \frac{\delta c}{\delta x}$$

If we should now accept the additional condition that the milk of magnesia on the one side of the permeable membrane and the wash water on the other side of that membrane shall be agitated so that no concentration gradients of electrolyte shall exist on either side of the membrane, then the concentration gradient  $\frac{\delta c}{\delta x}$  can be replaced by the factor  $(C^M - C^W)$  in which  $C^M$  is the concentration of electrolyte in the milk of magnesia and  $C^W$  is the concentration of electrolyte in the wash water, so that the question of distance is eliminated except in so far as it implies the two sides of the membrane. Thus,

$$\frac{dS}{dt} = -K Da (C^M - C^W)$$

One more condition of the proposed experiment differs from simple diffusion, namely that some solute will be adsorbed on the extensive surface of the milk of magnesia. This factor will be important in so far as it affects the value of  $(C^M - C^W)$  in the above formula. This value can of course be affected by this adsorption only by affecting the element  $C^M$ . Since only the non adsorbed part of solute in the milk of magnesia is freely diffusible,  $C^M$  refers only to the non adsorbed portion of the solute in the milk of magnesia. The total concentration of solute within the milk of magnesia is equal to

$$\begin{aligned} C^{M \text{ total}} &= C^{M \text{ adsorbed}} + C^{M \text{ free}} \\ \text{or } C^{M \text{ free}} &= C^{M \text{ total}} - C^{M \text{ adsorbed}} \end{aligned}$$

but from the well known Freundlich adsorption isotherm we can see that

$$C^{M \text{ free}} = C^{M \text{ total}} - MK C^{M \text{ free } 1/n}$$

$M$  = quantity of adsorbent

$K$  and  $n$  = constants characteristic of adsorbent and substance adsorbed

Due to the configuration of the exponential curve for the value  $-MK C^{1/n}$  (the Freundlich adsorption isotherm) we know that for large values of  $C^{M \text{ free}}$  the relative values of the adsorbed material are small so that  $\frac{C^{M \text{ free}}}{C^{M \text{ total}}} = \text{almost unity}$  and the error due to dropping the adsorbed solute from consideration is small. When the value of  $C^{M \text{ free}}$  becomes small then relatively the importance of the adsorbed solute becomes enormously larger, due again to the configuration of the exponential curve for  $-MK C^{M \text{ free } 1/n}$  (Freundlich adsorption isotherm). Now the value of  $\frac{C^{M \text{ free}}}{C^{M \text{ total}}}$  can become much less than unity.

At any rate, the theoretical basis upon which the problem should be viewed is the following equation which has been derived in the above manner from Fick's Law of Diffusion and Freundlich's adsorption isotherm

$$\frac{dS}{dt} = -K Da (C^{M \text{ total}} - MK C^{M \text{ free } 1/n} - C^W)$$

In practice, the importance of segregating for special consideration this influence of adsorption will depend upon the efficiency of the suspended material as an



adsorbent and the capillary activity of the solute. If one were to attempt, for example, to wash an efficient adsorbent material like a suspension of kaoline free from a highly capillary active solute like butyric acid the phenomenon of adsorption might become the factor of utmost importance and the simple diffusion of the unadsorbed portion the factor of lesser importance.

In the specific problem with which we were confronted the solute which was mainly sodium sulphate was a substance of very low capillary activity, the suspended semi-colloidal hydrated magnesium hydroxide was, however, a fairly efficient adsorbent. That adsorption phenomena play a rôle in the progress of the "washing" of milk of magnesia was not doubted. Since preliminary experiments by the diffusion method and past experience with the decantation method gave no indication that this phenomenon was sufficiently influential to present any special problem, no effort was made to determine its magnitude experimentally. The experimental work to be described was not carried out for the purpose of obtaining data with which to test the validity of the above equation or to obtain numerical values for the various factors involved. The work was entirely preliminary in nature, and its sole purpose was to gain some conceptions as to the type and size of equipment which might be required to "wash" milk of magnesia by a diffusion method, as well as the economies in time and water that might be inherent in such a method.

In spite of the fact that the equation derived was not actually used with the data presented in this paper, the mathematical analysis upon which it is based did furnish the complete understanding of the factors involved in this method of washing milk of magnesia which was deemed necessary to the proper planning of the experimental work.

#### EXPERIMENTAL

A cylindrical bag made of canvas filter cloth three inches in diameter and eight inches high was suspended in the center of a two gallon crock so that the bottom of the bag remained about one inch from the bottom of the crock. A 500 cc sample of recently precipitated milk of magnesia was put into the bag and enough water into the two gallon crock to bring it to the same level as that of the milk of magnesia. This required 4800 cc of water. Both the milk of magnesia within the canvas bag and the water outside this bag were continually and vigorously agitated by means of motor driven stirrers in order to fulfil the requirement that no concentration gradient of electrolyte should exist either in the milk of magnesia or in the water and also so that the milk of magnesia should not be able to settle nor to form crustations upon the inner surface of the bag. The progress of the diffusion or "washing," was followed by means of periodic conductivity measurements on the wash water. No effort was made to record these conductivity measurements in absolute units. In fact they were recorded in arbitrary scale readings which were equal to the reciprocals of the conductivities multiplied by a constant,  $\frac{1}{\kappa}$  ohms  $\times$  constant. A resistance of about 900 scale divisions was from previous work known to be that which corresponded to a fully 'washed' milk of magnesia, the same conductivity cell being used throughout. Distilled water so measured gave a reading of 1000 scale units.

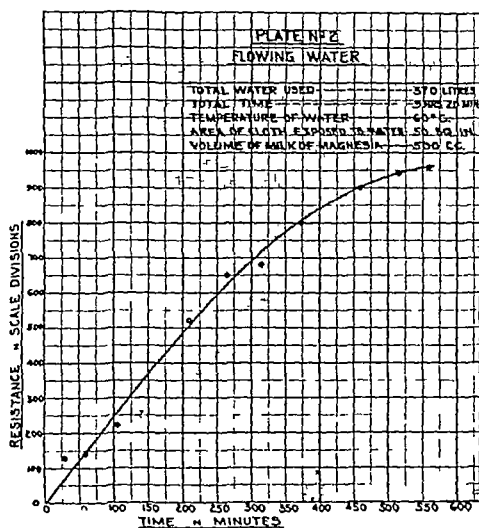
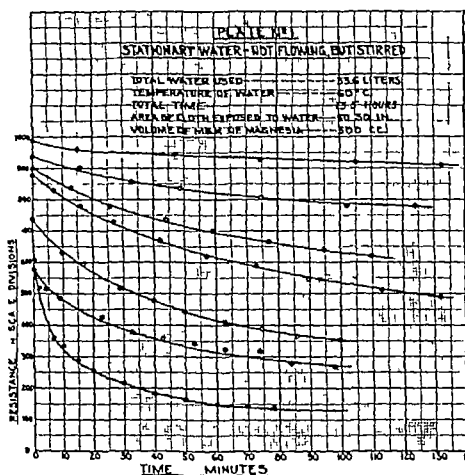
As equilibrium between the concentrations of the electrolyte in the milk of magnesia and in the wash water is approached the time resistance curve tends to become parallel to the line of abscissæ. When this tendency made itself apparent the particular portion of wash water was considered spent and was replaced by another portion. Plate No 1 shows these time resistance curves for each portion of wash water.

In order to wash the 500 cc sample of milk of magnesia to a conductivity of 1/910 scale divisions a total of 33.6 liters of water was required and an elapsed time of 13.5 hours at 60° C. This is five times as much water as was used in a parallel washing of the same quantity of milk of

magnesia by the decantation method, but the result was accomplished in only one tenth of the time required by the decantation method

The relatively larger quantities of wash water used in this method than those used in the decantation method are not inherently required by the diffusion method but result from the use of rather large portions of wash water. As is well known great economy of wash water for the washing of precipitates can be effected by the use of many small portions of wash water rather than a few large portions. For the same mathematical reasons, similar economy can be brought about in the diffusion method of washing by the use of many and smaller portions of wash water outside the bag.

In order to investigate the economy of water to be effected by the use of very small portions of water each brought fairly close to equilibrium with the milk of magnesia, before discarding it, it was considered expedient to abandon the use of mechanical agitation of the several portions of wash water and to allow it to flow through an annular space between the canvas bag holding the milk and the external vessel. This was accomplished by the simple procedure of substituting a smaller



vessel around the canvas bag described in the above experiment, so that the walls of the vessels were about one inch distant from the walls of the bag. The water was allowed to flow in at the bottom and to overflow at the top. The annular space was, of course, still too large to allow the linear rate of flow of the water to be sufficiently rapid to provide good agitation and at the same time to be in contact with the canvas bag for a sufficiently long time to come into equilibrium with the milk of magnesia.

It would, however, have presented too many mechanical difficulties to provide an annular space so small that the linear flow could have been rapid enough to be turbulent and still allow the required length of contact. In the absence of these mechanical requirements either time or water economy had to be sacrificed, and it was decided for the moment to sacrifice the latter. It will be seen from the graphical representation of the result in Plate No. 2 that the time required to accomplish the complete washing of the milk of magnesia was still further reduced, indicating

that when the annular space occupied by the wash water is sufficiently small, it is not necessary in practice to provide mechanical agitation to the wash water providing it is flowing at a moderate rate. From a consideration of the data on Plate No. 2 it will be seen also that due to the balance struck between the various factors it was not possible with equipment of the dimensions used to retain the full advantages of water economy without making a compensatory sacrifice of time.

It would be theoretically possible, of course, to adjust the dimensions of the equipment so that fuller advantage of the economies in both time and water could be had. Practically, however, this would be difficult and it was decided to pass immediately to the more practical experiment about to be described.

As intimated in the introduction, the saving of time afforded by the diffusion method of washing milk of magnesia makes it possible to consider a counter-current system. Such a system, if designed for continuous operation, would require long canvas tubes through which the milk would have to pass very rapidly in order to obviate deposition of magnesium hydroxide on the canvas walls. The mechanical difficulties involved in such a method would be considerable, and since we were concerned only with evaluation of the principle, an intermittent counter-current system was employed.

Each of five canvas bags was charged with 400 cc. of milk of magnesia, and suspended in a separate washing vessel containing three liters of wash water. Crude milk from the precipitation kettle met, in the first washing unit, wash water high in sodium sulphate (its washing power almost spent), and was allowed to remain there until the curve, constructed for time against resistance approached a horizontal straight line, indicating that concentration of solute in the wash water was nearing the concentration of that in the milk. The bag was then removed to the second washing unit where the initial concentration of sulphate in the wash water was lower. Finally the fifth wash was distilled water, in which the bag was left until the milk showed a conductivity of 1/900 scale units.

Regular operation of this discontinuous counter-current system showed that one charge was completed every two and one-half hours. A complete washing, therefore, required twelve and one-half hours, and while actually coming in contact with fifteen liters of wash water, each charge required only three liters of fresh water.

The economy of water obtained in this manner was, of course, very great. The amount of water used was only one-half of that required by the decantation method for an equivalent volume of milk, and only one-tenth of the amount required by the diffusion method in the first experiment above described.

The question of any practical utilization of this scheme would depend on a great many points, the consideration of which was not undertaken. It was possible from the above results, however, to calculate the dimensions which would be necessary for washing any given quantity of milk of magnesia in such a system.

Mathematically it is apparent that any of the dimensions of the canvas bags containing the milk of magnesia can be altered at will, so long as the amount of water which was found necessary to wash a given volume of milk is supplied and so long as the following relationship is maintained

$$\frac{\text{Area of interface} \times \text{Time of exposure}}{\text{Volume of milk}} = \text{Constant}$$

Substituting the values found in the laboratory experiment in which five bags each containing 400 cc of milk of magnesia, were washed 12 5 hours

$$\frac{191.4 \text{ sq in} \times 12.5 \text{ hours}}{0.529 \text{ gal}} = 4522 \text{ sq in-hours per gal of milk}$$

Applying this data to plant scale equipment a series of five canvas bags three feet in diameter by four feet high, having a total capacity of 1060 gallons of milk and a total effective area of 32 290 square inches would require 148 hours for complete washing thus delivering 172 gallons of finished milk per 24 hours Six such operating units would deliver approximately 1000 gallons

These calculations are of course correct only in proportion to the extent to which the fundamental factors can be maintained unchanged in passing from a small laboratory scale to the plant scale That this cannot be done is best illustrated by the fact that in the system we have visualized for plant practice, each outer vessel must contain 1590 gallons of wash water Therefore it must be eight feet in diameter, if the bottom of the bag is to be one foot from the bottom of this kettle Since the cloth bag containing the milk of magnesia is only three feet in diameter the annular space between the containers will be two and one-half feet This is hardly comparable to the one-inch annular space in the laboratory equipment The abandonment of agitation in the external wash water in the laboratory experiment was based on the rapid diffusion of the sodium sulphate and the small annular space, viz, one inch, so that the concentration gradient could still be considered negligible This would hardly hold good in the plant-size equipment now visualized and therefore one would need to assume agitation on both sides of the canvas once more in order to use these calculated dimensions

#### SUMMARY

A mathematical analysis has been presented for the case of washing a material in suspension by means of water separated from it by a permeable membrane The effect of adsorption as well as simple diffusion has been considered, and an equation derived from Fick's Diffusion Law and Freundlich's adsorption isotherm

A practical evaluation of this method of washing as applied to milk of magnesia has been carried out

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#### PHYSICIAN AND PHARMACIST \*

BY RALPH W CLARK <sup>1</sup>

The past quarter of a century has witnessed rapid changes in the character of the retail drug business However, the drug store is and always has been an essential and responsible factor in caring for public health To what extent this position will be preserved depends, I believe, somewhat upon what we as pharmacists do in our position in a triangle involving physician—yes, dentist and nurse, and pharmacist and the public

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\* Section on Practical Pharmacy and Dispensing, A Ph A, Portland meeting 1935

<sup>1</sup> Instructor in Pharmacy University of Wisconsin, Department of Pharmacy, Chairman, Committee on Inter-Professional Relationship of the Wisconsin Pharmaceutical Association

Medicine and pharmacy are sister sciences which have traveled hand in hand down the centuries from early times, since self-preservation has been instinctive in the human race. Dentistry and nursing are newer members of the public health professions but they occupy important positions.

The modern drug store is an institution containing a conglomerate assortment of merchandise. The proprietors of these stores vary in type as much as the stores they operate. It appears, then, that the approach to the physician, dentist and nurse is an individual problem. Much has been written about the subject assigned to me, but most of it is not of the kind which discusses the pharmacist himself. The problem, as I see it, is to convert more and more pharmacists to high professional standards which will naturally lead to better inter-professional relationship.

A pharmacist is influenced by several things—namely, college training, the literature he reads and the pharmaceutical associations to which he belongs, as well as the environment in which he works. The first three will be discussed briefly before anything is said about the individual responsibility of the pharmacist.

The present educational requirements make it necessary for the young pharmacist to have a college education before he may be licensed to practice pharmacy. It is desirable for each college of pharmacy to have as a member of its faculty at least one man who is particularly interested in inter-professional relationship, as students need information in this field which also furnishes a good point of contact between the college and those engaged in the practice of pharmacy.

The next generation of pharmacists will be of higher professional standing because of the advance in educational requirements. These men should be taught methods of contact with members of the related health professions as well as a profound interest in public health. They should above all things be imbued with a higher sense of their own professionalism. With a background of the usual things taught in the pharmacy school, they should be better able to carry on the type of contact which pharmaceutical manufacturers have found very valuable.

Many pharmacists do very little reading in either trade or professional magazines. These publications carry much useful information and pharmacists should be more familiar with them. Perhaps more emphasis on contemporary literature in colleges of pharmacy would get our future pharmacists into better reading habits. The pharmaceutical press has been and should continue to be of value in educational programs. From time to time campaigns have been inaugurated against irregular prescription pricing and other practices involved in inter-professional relationship.

National pharmaceutical associations are helpful in keeping a unity of purpose throughout the states and in supplying valuable material for use in this work. State pharmaceutical associations play an important part in the progress which may be made. In Wisconsin much more interest is being shown in inter-professional relationship meetings throughout the State during the year and in conventions of the Wisconsin Pharmaceutical Association, the report of the chairman of the committee on inter-professional relationship and the talk in a similar vein by O. U. Sisson stimulated more discussion than usual, in fact, more than most other parts of the program, showing that pharmacists are becoming conscious of the value of this work. Here the state association is doing its part by holding the

meetings referred to and by continual publicity in the *Wisconsin Druggist*, official publication of the Association. This practice is more or less common to other states.

The unfortunate thing about inter-professional relationship activities in a state association is that the officers will spend about ten cents per store in the state on a project like this and feel that they have done well by it while they will spend many times this amount on other activities. On the other hand, every man showing an interest in this field of endeavor is of great value to his association and it is encouraging to note that the number is gradually increasing.

The public and the members of the public health professions will not believe that "the druggist is more than a merchant," nor that he is a professional man if certain individual pharmacists do not uphold the standards involved. People are generalizers. If a pharmacist is careless in compounding one prescription, they are inclined to say that all pharmacists are careless in compounding all prescriptions. What we need is less unfavorable publicity showing a lack of interest in public health, less development of the liquor and restaurant portions of drug stores and more cleaning up and merchandising of the prescription department. Pharmacists who have not neglected this part of their stores have been and will continue to be better off than those who run a business too much like a department store.

Pharmacists must watch out for the public's interests and the interests of the members of the public health professions, as well as their own. They may call upon a physician or dentist to ask what service they may be to him. By keeping up-to-date on new remedies, and, unless I am mistaken, in many cases, getting better acquainted with the current revision of the U S P and N F as well as other books and magazines, the pharmacist calls on a physician or dentist well-prepared to carry on a friendly, intelligent conversation, and inspire in him an interest which may be of mutual benefit. The physician may be surprised to know how misleading some of his orders are and that he should not price them to the patient as he knows little about the cost, overhead and turnover in the prescription department. He may be made to see that a trial balance drawn between counter-prescribing on the one hand and office-dispensing on the other would show no advantage to either profession, not to mention the effect upon the patient whom both professions should serve to the best of their ability.

The physician may be willing to prescribe more U S P and N F preparations when he is told what they contain and the reduced cost of the medicine to his patient. He will be surprised to learn that certain proprietary products, especially those with short, easily remembered names, widely prescribed by physicians a few years ago are now advertised directly to the public. He may be made to understand that real compounding is an art and that pharmacists are better qualified than he to do this work. He may be shown that individual prescriptions are often better than bottle to bottle proprietary preparations which may be used by every physician in town. He may become a good friend, a better physician and a better prescriber.

Cooperation with dentists, a new field, should be undertaken with caution. There are several drugs of proven usefulness in the U S P and N F as well as many other items with which the pharmacist should acquaint the dentist. Den-

tists will welcome such efforts if the pharmacist uses intelligent reasons, drawn from the ideals of both professions, to recommend his services and they may become prescribers instead of dispensers

It is necessary for pharmacists to show an interest in public health, to favor public health legislation, to be interested in civic affairs. In this way favorable publicity may be had which will help in the contact with the public and the public health professions. It is necessary for pharmacists to emphasize service and quality, not price, in their contact with the public health professions. Substitution should, by all means, be avoided but the pharmacist should make use of his skill and training in promoting U S P and N F products. He should be sure to point out that more than materials go into a prescription and the cost to the patient will, therefore, not be in direct ratio to the cost of the ingredients. Pharmacists should make more use of their professional training and should consider their skill, accuracy, responsibility, time and overhead in the selling price of a prescription. The public and the public health professions can be made to understand these things only if the pharmacist is professional and acts as a professional man should.

If every pharmacist were an asset to his profession the accumulation of favorable publicity would be far-reaching. If professionalism were stressed somewhat more, the public would be willing to pay for more than the materials which go into a prescription and to accept the pharmacist as more than a merchant. If more pharmacists were willing to put their own houses in order first, then good inter-professional relationship would fast become a fact instead of an ambition stimulated by the decrease in the number of prescriptions being filled. Such individual activity would help inter-professional relationship and raise public opinion of pharmacists. It would be far better than sitting back as a witness to the modern spectacle of having a supposedly intelligent American audience receive its instruction in medication over the radio: the dispensing done by highly trained script readers or black-faced comedians, or rocked into a false sense of healthful security by sweet music advertising nostrums "for sale in every drug store."

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### HONORING AGE AND SERVICE \*

BY JOHN E. KRAMER <sup>1</sup>

A custom established in 1928, a mere seven years ago, would not seem to have gained very great historical importance in such a short space of time. But when the inauguration of the custom entailed an event that had happened fifty years before—history was definitely involved.

In the early Spring of 1928 the officers in charge of the pending Alumni Reunion of the Philadelphia College of Pharmacy and Science endeavored to induce as many graduates as they could to return to the College for the annual meeting of the Alumni Association and the various class reunions. Special stress was placed on the members of those classes who had graduated five, ten, fifteen and other intervals of five years before.

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\* Section on Historical Pharmacy. A. P. H. A., Portland meeting 1935.

<sup>1</sup> Registrar Philadelphia College of Pharmacy and Science.

The committee was gratified because of the interest aroused among the members of the Class of 1878. A surprising number indicated their intention of attending the reunion, and the committee cast about for some proper recognition of the fact that the returning members of the Class of 1878 had been fifty long years out of college and still had enough interest to return, some of them from distant points.

And so there was started, more or less in fun, the group known as the "Semi-Centennialists of the Alumni Association of the Philadelphia College of Pharmacy and Science," with handsomely printed and properly signed certificates, and, best of all, no dues and but one requirement, that of graduation a half century before.

The idea met with instant success and has been continued each year since 1928. The certificates have since been removed from the jocular blue-print class and have become neatly printed and nicely engrossed affairs. From 1928 to 1934, a total of 375 have been issued.

The phraseology of the certificates is quaint and original—

"WHEREAS—so and-so—a graduate of the Class of ——— has most successfully completed fifty years of Post Graduate Extra-Mural-Honest-to-Goodness Service in the varied interests of his fellow men—he is hereby declared to be a Semi-Centennialist, and, as such, entitled to All the Privileges of this Illustrious Order

"In testimony whereof are hereby affixed the signatures of the officers qualified to bestow this Unique Recognition "

Then follows the date, and the signatures of the Alumni Association President and the Chairman of the Reunion Committee. A seal, reading "50 years Humanitarian Service," is in the lower left corner of the certificate.

At a fitting ceremony at each annual meeting these scrolls are awarded, and the appreciation of the recipients is wonderful to behold. One would believe they had received the highest awards possible in the field of pharmacy. Even those who are too far away, or too infirm to attend, and who have had their certificates mailed, are greatly impressed, as evidenced by their letters.

After all, why shouldn't age and service be properly recognized? For, as Nicholas Rowe, English poet, said, "Age sits with decent grace upon his visage, and worthily becomes his silver locks, who wears the marks of many years well spent, of virtue, truth well tried, and wise experience "

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## PHARMACY IN MEXICO

BY G. G. COLIN \*

When dealing with the subject under consideration, pharmacy must be divided into two groups, professional and non-professional, the former is the graduate pharmacist and the latter, called "boticario," is a practical man with experience in routine pharmaceutical practice but without college training. There are about 5000 pharmaceutical establishments in Mexico, 95 per cent of which are managed by boticarios.

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\* Laboratorio Quimico, Central S. A. Mexico, D. F.



Now and then, as a consequence of lack of legal regulations on professional practice, not only in the pharmaceutical field, long and heated debates are heard in Congress when Article four of the Constitution is discussed. Professional pharmacists press on the necessity of limiting the practice to licensed, graduate pharmacists. On the other side of the question and several thousands strong, the boticarios appeal that this condition has prevailed for many years and that any legislation limiting their freedom to work is unconstitutional. The professional side brings forth weighty arguments as regards the menace to public health, the responsibility and security which only a professional man can offer in pharmaceutical practice, to safeguard the public and to insure accurate compounding of physicians' prescriptions. The outcome usually is that, considering the economic injury which would be caused to the majority, the regulations of Article four of the Constitution are postponed for the next period and the problem has remained unsettled for many years.

The Health Department controls the regulations and licensing of both kinds of pharmaceutical establishments, but its suggestion to make it compulsory that every pharmacy should have a graduate pharmacist to assume the responsibility of dispensing has not been considered legal by the upper authorities. The most that can be done to safeguard the public is to make a requirement whereby every pharmaceutical establishment must have a sign in a visible place, stating whether the proprietor or manager is a graduate pharmacist or not. The requirement is met by both by using the proper legend in the sign. The public apparently does not seem to read these signs or if it does, the significance of the fact is ignored.

In a general way it may be stated that pharmacy is not given the proper recognition it deserves, neither by the authorities nor by the public.

As regards scientific societies, there are two: the Sociedad Farmaceutica Mexicana and the Union de Quimicos Farmaceuticos. The former is upheld by the oldest pharmacists in the city and is responsible for the 1925 edition of the non-official *Farmacopea Mexicana*, an excellent reference book containing very valuable data on a large number of Mexican native drugs. However, it has failed to attract the younger element and its field of action and influence is very limited, its main purpose at the present time is to offer a small life insurance and financial assistance to its members. The latter has been organized on the basis of a labor union and as such defends the material interests of its members only.

There are a few pharmacists who working independently have contributed to the scientific progress of pharmacy by active research on native drugs.

Pharmacy has taken much the same modern trend here that is observed in other countries, that is, the tendency to become a commercial enterprise based on the sale of patent medicines with non-pharmaceutical side-lines. From the commercial point of view, the financial situation of the large majority of pharmacies in the country is not a very sound one. Price cutting on prescriptions and patent medicines has created a difficult problem as yet unsolved.

There is an actual unemployment problem among graduate pharmacists, whose services have no demand. As stated before, the financial situation of the "boticas" is such that they cannot afford to pay the salary of a pharmacist, although a few have made an effort to improve their standing by having one, part-time at least.

The situation as briefly described naturally hinders the progress of pharmacy.

in the country. If both groups could come to an understanding, to organize for the betterment of the trade in mutual benefit the situation might improve. However, all efforts to unite have failed so far, each one meeting his problems separately.

Although the pharmaceutical and medical professions should be closely allied, the lack of organization of the former has not made it possible to approach the physicians for cooperation. The pharmacist, individually and in isolated cases, does try to offer his close cooperation to physicians in a special neighborhood or territory but as a whole their relations are not as cordial as might be.

Such a situation is the outcome of present social and economic conditions. Labor problems arise continuously in a steel mill as well as in a pharmacy or a hospital, affecting skilled and unskilled labor, and the consequence is that the professional man is swept by this tide toward solidarity groups to safeguard material interests. Whatever few scientific activities are carried out by the pharmacist are of a strictly private nature, unpublished.

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### SOME THOUGHTS ON DISTRIBUTION

E. L. Newcomb has stated: "It must be increasingly evident to all who have given the problems of distribution thoughtful study that the unfair practices and evils which exist may only be lastingly curtailed or removed when policies are adopted which are basically sound, fair to and in the interest of the consumers, all types of distributors and producers."

Liberty is taken in quoting the above, the thought underlies measures which are being considered by Congress and urged for national and state enactments. American industry has realized that the inequities which have existed must be corrected, and there has been expression in Congress relative to the necessity of righting the practices which are manifestly unfair because of preferences, and have resulted in undermining the business of a majority of dealers and making those who do not receive preferred (unfair) consideration, independents.

Some of the legislation in Congress has as a purpose the correction of unfair practice and it is being realized by the legislators that the destruction of the majority, or making it impossible for "small dealers" to carry on, affects the standard of livelihood of their constituents and citizenship in general. A further study may encourage the members of Congress to bring certain measures near completion to enactment.

Former and present practices may develop self-reliance, industry, energy and initiative, but the times demand a new feeling of social unity, a fairer distribution of privileges and a wider application of the Golden Rule.

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'The Patent Office will celebrate its one hundredth birthday on July 4th. But it is really 46 years older than it officially admits, for in 1790 Thomas Jefferson, then Secretary of State, took on the job of granting patents.

"Edwin M. Thomas, of the Patent Office, who has made a detailed study of past records for publication of a special anniversary history, said that a look through the records clearly shows the trends of modern industry. The businesses of the future come first in the Patent Office and are recorded there about two years before they reach the public."—*Washington Post*

TESTING THE RECOGNITION FACULTIES OF STUDENTS <sup>1</sup>BY JOSEPH H GOODNESS <sup>2</sup>

It is an almost universal truth that teachers dread examinations more than their students do. Perhaps some dread the long hours of tedious grading, but more do so because of the feeling that the examination is not a truly representative test of what the students have learned, or of what they should know. A too difficult examination finds the teacher searching for points between the lines, so that a passing grade may be given to the "average minds," whereas a too simple examination destroys the grading qualities of the test and finds the teacher searching for errors, so that the students may be graded comparatively. An all-practical or problem examination leaves the "mirror minds" among the failures, and an examination consisting only of questions discussed during the term ruinously affects the application of future classes. This last is the result of the "grapevine" information on instruction methods passed on to incoming classes. The teacher must, therefore, make an examination that is representative of the work covered during the year or term, that stimulates some original thought, and that does not destroy the chance of a last favorable impression of the subject, moreover the examination should be one that does not mark the course as a "snap," and that is not too short or too long for the student of average ability to answer in the time allotted.

The first two requirements are perhaps the most difficult to attain. To make a representative examination as well as one that stimulates thought has, sooner or later, led every teacher into the study of methods and means. Some conclusions which the author has reached during several years of study may be summed up as follows:

There are but two basic types of examination questions. *First*, the recollection type, which gives no clues and demands of the student a complete mental picture (recollection) of the answer before he can attempt to write, and *second*, the recognition type, which demands an understanding (recognition) of one of several given answers, or a rejection or acceptance of a conclusion furnished.

The recollection type is well known to all examiners. It is exemplified by such questions as "Name the five parts of \_\_\_\_\_," "Give an example of \_\_\_\_\_," "Explain the operation of \_\_\_\_\_" and "List or outline \_\_\_\_\_." Here the student must recall without aid from the question the exact mental picture or pictures formed during lectures or readings, and coordinate them before he can answer. Unless the mental picture is complete, there can be no correct answer except, perhaps by the rarest of guesses. There is no doubt that this type of question cannot be dispensed with in examinations, but it alone is not the answer to the search for a representative test of what the student has learned.

The recognition type of question, better known as the true false question, is the other basic type. It appears in many disguises. A few of these direct the student to answer with a single word, "yes" or "no," others request him to underline the correct word (of several), or to match the two (or more) parts that make sense, or to check the correct answer or to pick the best answer.

<sup>1</sup> Based upon a paper read before the Section on Education and Legislation A. P. H. A., Portland meeting 1935.

<sup>2</sup> Assistant Professor of Commercial Pharmacy and Economics, Massachusetts College of Pharmacy.

The use of this type of question is defended upon the ground that it saves time for both student and teacher, and that a knowledge of the facts involved is necessary before one can answer. The bad features of it often overlooked, are *first*, that in all these forms the correct answer is already supplied needing only identification by some mark, or that there is a fifty per cent chance of guessing the correct answer, and *second*, that no provision is made to discourage guessing or to induce thinking that can be measured. Since, in these true false tests there is no way, by analyzing the shape of the check mark or underscoring, of sorting the guessers from those who really know, this type of question is decidedly imperfect and unfair if given solely

On the whole, then, our conclusion seems to be this. For the equitable grading of students only the recollection type of question is good. So far, this is perhaps true. We must then question the reason for the existence of the recognition (true-false) form of examination. The answer, no doubt, is that its originators had studied the basic makeup of every day problems and found that very often the knowledge that something is wrong was all that was necessary to solve the immediate problem, and that to know the correct facts, if there were correct facts involved, was immaterial. For example, an error of dosage in a prescription whose author cannot be reached, or a claim of excessive profits for a store you had contemplated buying, or an impossible chemical result from known ingredients, all show instances where the mere knowledge that something is wrong is sufficient warning not to venture further. But, although this knowledge of a negative nature (recognition) is indispensable in practical life, up to the present time no examination system has been devised which will measure it accurately. The true-false examinations fail primarily because they do not set up inhibitions to the guess impulse that arises in students when the correct solutions are not forthcoming. In an attempt to lessen this fault, the author experimented with a new form of the true-false test which, he believes, overcomes more than half of the weaknesses usually found in the forms generally used. The remaining faults cannot be cured by simple means, if at all.

In this new form the testing is accomplished through the use of statements that may or may not require correction. The correction can be made only if the student thoroughly understands the statement as made, or understands a topic it comprehends. In short, the answers require both accurate recognition and recollection. Recognition first, to inform the student of the accuracy or inaccuracy of the statement, then recollection, to make the necessary change of one word to correct the sentence, or to leave it untouched if the statement is correct.

#### SAMPLE SHEET OF A CHANGE A-WORD EXAMINATION SHOWING PERMISSIBLE CORRECTIONS

In the sentences below any *SINGLE* superimposed italicized word corrects the statement in which it appears. More than one change is shown in some statements to indicate how flexible correct answers to them may be. Accurate statements, some of which should be present, are omitted.

Directions. Correct only the inaccurate statements that follow. The correction must be limited to *CHANGING* only *ONE* word.

#### Economics

Gresham (1)

food (2)

population (3)

- 1 Malthus advanced a theory concerning money  
(Corrections are to read separately, thus

- (1) *Gresham* advanced a theory concerning money
- (2) *Malthus* advanced a theory concerning *food*
- (3) *Malthus* advanced a theory concerning *population* )  
*copyrights* (1) *protect* (2)
- 2 Patents and secrets create monopolies  
*insurance* (1)
- 3 Hedging arbitrage and future contracts are methods of shifting risk  
*stock* (2) *industrial* (4)  
*run* (1) *inventory* (3) "*corporate*" (5)
- 4 Money borrowed to build a factory is commercial credit  
*partner* (1)  
*director* (2) *legal* (3)
- 5 A creditor possesses management rights in a business  
*No* (1) *partner* (2) *leaves* (3)
- 6 A stockholder dissolves a firm if he sells his interest therein

### Bookkeeping

- Prepaid* (1) *income* (2) *liability* (3)
- 1 "Accrued" added to an expense title makes it an asset title  
*Purchases* (1) *expense* (2)
- 2 The Discount on Sales account is an income account

### Chemistry

- N<sub>2</sub>* (1)
- Co* (2)
- Fe* (3) *one* (4)
- 1 Copper has valences of two and three  
*Copper* (1)  
*Iodine* (2) *K* (3) *Na* (4)
- 2 Zinc is below hydrogen in the electrochemical series  
*Silicon* (1)  
*Oxygen* (2) *K* (3) *C* (4)
- 3 Sodium is more plentiful than aluminum in the earth's crust  
*iodine*
- 4 Chlorine, bromine and neon are halogens

This type of examination fails in its purpose unless conducted under the inflexible rule that statements are not to be changed in any way if they are correct as they stand, and if they are wrong they must be corrected by the only permitted method of *changing* but *one* word. While at first glance this rule seems needlessly strict, the author has found that any relaxation whatsoever upsets the reliability of the results as a measure of recognition or else develops other bad features. For instance, when marking an inaccurate statement with an "X" was allowed if the student could not correct the error, some papers had as much as sixty-five per cent of the statements needing correction so marked, evidently no attempt was made to think out the correct answers. About the same result was obtained when students were allowed to underline the incompatible words if substitute words for one of them were not recalled. (This fault may be tolerated under some arrangements.) To allow changes of more than one word gave students an opportunity to transform law questions into chemistry and pharmacy questions into arithmetic.

Because of the strict rule, the effectiveness of this examination is not left to the student's veracity. Of the six possible results that may occur in the completed statements, five of them are controlled by the rule, the sixth is not so well guarded,

but even here guessing is discouraged by it. Since statements as presented to the examined must be either accurate or inaccurate, the analysis of the answers in their different forms follows:

A wrong statement left unchanged shows a lack of recognition and receives no credit.

A wrong statement changed to another wrong statement may show recognition, but since the recollection is imperfect, gets no credit.

A wrong statement corrected gets credit for recognition and perhaps for recollection. If the change was merely a reversal of a positive to a negative or vice versa, then only half credit can be given, for only recognition is proved.

A correct statement changed to an incorrect shows lack of both accurate recognition and recollection, therefore no credit is given.

A correct statement changed to another correct statement shows lack of accurate recognition and even though accurate recollection is used, because of the rule gets no credit.

A correct statement left unchanged may show recognition, and must get full credit even though the student may have guessed the answer.

In the last type of answer the tendency to guess is lessened, for the student who guesses finds it difficult to guess by inaction (not changing a word) and so very often slips into the five rule-made traps. If he does guess by the only undetectable method of not changing words, nothing but the student's honesty can disclose it. But there is some consolation in the fact that unchanged wrong statements will decrease the grade. Because correct statements are subject to the weakness of guesswork possibility, it is suggested that their number be reduced to considerably less than one-third of the examination. This will cut down undeserved credit, as was confirmed by an experiment described below in which a total of 425 correct answers contained 350 untouched correct statements (almost all identified as guesses).

The grader may, of course, relax the rule and give half credit for correct-to-correct changes, but if this is done the tendency of students to change all unrecognized accurate statements to known truths will be encouraged. Further, this credit should not be allowed unless notice to that effect was given before the test, for to omit such notice is to penalize students who follow the rule implicitly. If the test is mainly to measure recognition, the relaxation cannot be permitted.

To summarize the grading systems a chart follows in which "W" symbolizes inaccuracy, and "C" accuracy.

Statement	Answer	Rule Credit	Relaxed Credit
W	No change	None	None
W	W	None	One half
W	C	One-half/full	Full
C	W	None	None
C	C	None	One half
C	No change	Full	Full

The relaxed rule credits are not recommended for general use.

To measure the relative grading effectiveness of this new form of test, 97 students were given two examinations of twenty statements: an Advanced Pharmacy test in the true-false form which required only plus or zero signs for answers, and a Bookkeeping test in the change-a-word form. Each examination contained six

accurate statements in the positions 1, 2, 3, 4, 13 and 17, the rest were inaccurate. These subjects were chosen because the examined were not familiar with them, and so, if the examinations could grade recognition accurately, the grade received by each student in each examination should have been a zero. Any grade above zero must therefore arise from guessing, examination or grading weaknesses, or student knowledge. For assurance that real knowledge was not charged to guessing, students were asked to mark each answer that they were reasonably sure was accurate with a "K". Correct answers so marked were subtracted from the total correct answers to give the total correct guesses. Inaccurate statements marked with a "K" were treated as wrong. Students were required to answer all twenty statements.

Of the 97 sets of papers received, 12 were discarded—2 because they were incomplete in the true-false test, and 10 because the examined had had some experience with bookkeeping. Summaries of the remaining 85 sets follow:

	Total Correct Guesses	Total Correct Answers	Total Correct K's (Know)	Total K's (Know)
True false	699	732	33	79
Change a word	343	425	82	217

Number of Correct Guesses	Grade Received for Guesses	True False Examination	Change a Word Examination
0	0%	0	4
1	5%	0	4
2	10%	0	17
3	15%	1	7
4	20%	3	14
5	25%	8	17
6	30%	3	14
7	35%	17	6
8	40%	14	1
9	45%	15	1
10	50%	11	0
11	55%	2	0
12	60%	8	0
13	65%	3	0
Total students		85	85

	True False	Change-a Word
Average number of correct answers	8.61%	5.0%
Average grade on correct answers	43.05%	25.0%
Average number of correct guesses	8.22%	4.03%
Average grade on correct guesses	41.10%	20.15%

As can be seen, the grading effectiveness of the change a word test is 103% higher than the old true false test, or in other words, slightly more than twice as accurate.

Number of students getting a higher mark in the true false test	70
Number of students getting a higher mark in the change a word test	6
Number of students getting the same grade in both examinations	9

Guessing in this examination is discouraged for other reasons than those already mentioned. For example, students cannot write a word with the same abandon exercised in underscoring or checking and so will think long before hazarding all on a guess. Also since there may be from one to ten or more corrections possible in many of the statements, thinking is encouraged. Not infrequently teachers will find conversions which they themselves had not anticipated but which show high intelligence.

Other advantages of this examination are that it can be easily and uniformly graded, it can be adapted to any subject, and it can be made very specific for commonly confused facts. Further, it can be made comprehensive without requiring a great deal of writing for the answers, since the mere mention of a topic in the statement demands a mental review which would perhaps require hours to put into writing—much of which thought can be “seen” in the relationship between the original statement and the completed answer.

Naturally, this form of examination, like all examinations, has limitations and cautions which must not be overlooked. *First*, it cannot entirely eliminate guessing. Guessing is a fault inherent in the student, not in the examination. This examination does, however, reduce guess-earned grades to a minimum by making many guesses easily discernible. *Second*, the examiner's difficult work precedes the efforts of students, since the statements must not be ambiguous (except perhaps for the inaccuracy), nor such that a change from the negative to the positive or vice versa will be encouraged, nor such that they suggest the answer through stilted use of the singular, plural or numerals. Nor should they all be of the short two fact type (e g, a horse is a biped), nor too involved or complex. Sequence, series, definitions and commonly confused facts are excellent fields for the statements. *Third*, students must be taught in advance how to take these examinations. Unless this is done many will treat them as they do true-false tests, with which they are more familiar, marking them with plus and zero signs. And *fourth*, the examination does not sufficiently test student creative or recollective faculties. For this reason all examinations should contain the recollection type of question without clues, as well as problems which involve recollection. To prove this point, the standing of five of the highest and five of the lowest students in a class was compared with the standing of the same students in a change-a-word test. The class standing was determined by averaging for one-half of it the recitation grades of eighteen weeks, and for the other half, the two examination marks earned during the same period (one of the examinations included the comparison change-a-word test as one-fifth of the grade).

HIGH				LOW			
Averages of Term Examinations	Average for Recitations	Final Class Average	Change a-Word Examination Average	Averages of Term Examinations	Average for Recitations	Final Class Average	Change a Word Examination Average
96	87	92	95	67	61	64	50
95	88	92	90	66	60	63	30
96	84	90	95	64	60	62	50
97	80	89	90	69	53	61	70
90	87	89	80	67	55	61	55

As can be seen, too wide a spread exists in many cases to justify the use of ti



new examination as a sole grading device. This limitation is especially applicable when examinations are short and each answer bears a high credit rating.

When the author first used this form of examination, a questionnaire of the examined disclosed that of the 167 taking the examination 93 liked it and 74 disliked it. Although unsigned student comments are to be taken with a grain of salt, especially before the tests have been graded, they do point here to an encouraging acceptance.

## THE MASSACHUSETTS PHARMACOPŒIA OF 1808 \*

BY EDWARD H. NILES <sup>1</sup>

The Pharmacopœia of the Massachusetts Medical Society was issued in 1808. In consideration of the fact that Pharmaceutical History is now a regular part of the curriculum of our colleges of pharmacy, it is the purpose of this paper to suggest that the Massachusetts Pharmacopœia is the logical background for the study of official pharmacy in the United States.

The preface of this book, written more than 125 years ago, treats of pharmacy and medicine in a rational way. The following statement is quoted:

Such a work is mutually convenient to the physician and apothecary. As it is the business of the physician to prescribe, and of the apothecary to prepare medicines, the physicians as a body ought to point out those articles of medicine which they should ordinarily employ and the standard preparations of them. The professions of physician and apothecary are most distinct, and between those whose relation to each other is so important a perfect understanding should exist. As this cannot be established between them as individuals, it is necessary that there should be uniformity both in the pharmaceutical preparations and language. By the want of such uniformity, much inconvenience and even very serious consequences have been produced."

The Edinburgh Pharmacopœia was frankly chosen as the basis of the Massachusetts book. However, the committee was permitted such omissions, alterations and additions as were found necessary. Among the most important additions were articles found and used in America, but not included in the Edinburgh Pharmacopœia.

The outstanding difference in the two books was one which reflected the independence of thought and disregard for European tradition, a characteristic of New England in that period. All previous pharmacopœias such as those of London, Edinburgh, Dublin, etc., had been written in Latin. That is, in addition to the titles, even the quantities and directions for compounding were written in Latin. In the Massachusetts Pharmacopœia only the titles were Latin, the text being in English.

When the first United States Pharmacopœia was issued in 1820, the committee apparently endeavored to steer a course that would be acceptable to tradition and also to popular demand. The United States Pharmacopœia proper was printed in both languages. The left-side page was in Latin and the opposite page was in English. This of course increased the size and cost of the book, and did not add to its usefulness in English speaking America. Old ideas die hard, and the same two language plan was followed in 1830, but in 1840 and thereafter the United States Pharmacopœia followed the lead taken by Massachusetts in 1808, with English text only.

\* Section on Historical Pharmacy, A. Ph. A., Portland meeting, 1935.

<sup>1</sup> Dean, Indianapolis College of Pharmacy.

Dr Lyman Spalding was a native of New Hampshire, and practiced medicine many years in that state. He was familiar with the Massachusetts Pharmacopœia, as this book was officially adopted by the Medical Society of New Hampshire. Dr Spalding, later, became the head of a medical school in New York State, and finally opened an office in the city of New York in 1814. About 1817 he began plans for the preparation of a national Pharmacopœia, and his proposals were favorably received.

The Massachusetts Pharmacopœia had been prepared by James Jackson and John C. Warren, as a committee. Dr Warren was chairman at a meeting held in Boston, June 1819, when delegates were chosen to go to Washington and arrange for the first United States Pharmacopœia. Dr Bigelow of Massachusetts and Dr Ives of Connecticut represented the New England states or Northern District. They took with them a specimen pharmacopœia, and thus no doubt was approximately that of Massachusetts. At a convention held in Washington January 1, 1820, five members were chosen to prepare the first United States Pharmacopœia, and Dr Ives and Dr Bigelow were included in this group.

The Massachusetts Pharmacopœia of 1808 listed 536 drugs and preparations, the first edition of the United States Pharmacopœia listed 532 items. There was a greater difference than the seven items in these two books, but more than ninety per cent of the articles in the Massachusetts book were included in the later publication. Some interesting differences follow:

Absinthium in the Massachusetts Pharmacopœia, 1808, in the U. S. P. 1830

Aspidium in the Massachusetts Pharmacopœia, 1808, in the U. S. P. 1860

Cochineal in the Massachusetts Pharmacopœia, 1808, in the U. S. P. 1830

Conium Seed in the Massachusetts Pharmacopœia, 1808, in the U. S. P. 1830

Althea Root in the Massachusetts Pharmacopœia 1808, in the U. S. P. 1830

The Massachusetts Pharmacopœia listed three emulsions under the Latin title *Emulsio*, including that of Sweet Almond. The United States Pharmacopœia had similar preparations from the beginning, but the title "*Emulsion*" was not official until 1880, nearly 75 years after its introduction in the Massachusetts edition.

The following drugs were in the first United States Pharmacopœia, but are strangely missing from the Massachusetts publication: *Ginger*, *Gaultheria*, *Ergot*, *Carthamus*, *Cimicifuga*, *Coptis* and *Apocynum*.

In passing, one may note a bit of chemical history or biography. The Massachusetts Pharmacopœia included "*Carbonated Water*," and gave a method of preparation by decomposition of calcium carbonate with sulphuric acid. In the working directions it recommends a Woulff bottle. Possibly the three commonest pieces of equipment in a general chemical laboratory are a Bunsen burner, a Liebig condenser and a Woulff bottle. The first United States Pharmacopœia lists "*Carbonated Water*" and uses the synonym "*Seltzer Water*," but it does not mention the Woulff bottle.

As a final analogy between these two books, it may be mentioned that the Massachusetts Pharmacopœia was published<sup>1</sup> in Boston at No. 47 Cornhill, while the United States Pharmacopœia of 1820 was published in Boston at No. 50 Cornhill.

<sup>1</sup> See also JOURNAL A. P. H. A., for November 1935, page 941.

THE ANCIENT MEDICINAL USES OF GEMS AND PRECIOUS STONES \*<sup>1</sup>BY A RICHARD BLISS, JR.<sup>2</sup>

The love of precious stones has always been deeply implanted in the human heart, and the cause of this is found not only in their coloring and brilliancy, but also in their durability. The beautiful colors of flowers and foliage, and even the blue of the sky and the glory of the sunset clouds only last a short time, and are subject to continual change, but the sheen and coloration of precious stones are the same to-day as they were yesterday and will be to-morrow. In a world of change this permanence has a charm of its own that was early appreciated by man.

The object of this paper is to discuss and to illustrate the various ways in which precious stones have been used at different times and among different peoples, and more especially to explain some of the curious ideas and superstitions that have gathered around them. Many of these ideas may seem strange enough to day, and yet when we analyze them we find that they have their roots either in some intrinsic quality of the stones or else in an instinctive appreciation of their symbolical significance. Through manifold transformations this symbolism has persisted to the present day.

Our scientific knowledge of cause and effect may prevent us from accepting any of the fanciful notions of physicians and astrologers of olden times, nevertheless, the possession of a necklace or a ring adorned with brilliant diamonds, fair pearls, warm, glowing rubies or celestial-hued sapphires will make a modern woman's heart beat faster and bring a flush of pleasure to her cheek. Life may seem better worth living to her, and, indeed, life is what our thoughts make it, and joy is born of gratified desire. Nothing that contributes to increasing the sum of innocent pleasures should be disdained, and surely no pleasure can be more innocent and justifiable than that inspired by the possession of beautiful natural objects.

From the earliest times in man's history gems and precious stones have been held in great esteem. They have been found in the monuments of prehistoric peoples, and the civilization of the Pharaohs, of the Incas or of the Montezumas did not alone invest these brilliant things from nature's jewel casket with a significance beyond the mere suggestion of their intrinsic properties.

The magi, the wise men, the seers, the astrologers of the ages gone by found much in the matter of gems that we have almost forgotten. With them each gem possessed certain planetary attractions peculiar to itself, certain affinities with the various virtues, and a zodiacal concordance with the seasons of the year. Moreover, the early sages were firm believers in the influence of gems in one's nativity, and that the evil in the world could be kept from contaminating a child properly protected by wearing the appropriate talismanic, natal and zodiacal gems. Indeed,

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\* Section on Historical Pharmacy. A. P. H. A. Portland meeting 1935.

<sup>1</sup> A contribution from the Laboratories of Pharmacology, Howard College of Birmingham, Alabama, and the Reelfoot Lake Biological Station at Reelfoot Lake, Tennessee.

<sup>2</sup> Professor of Pharmacology and Dean of the School of Pharmacy of Howard College of Birmingham, Alabama, Director of The Reelfoot Lake Biological Station, Reelfoot Lake, Tennessee.

folklorists are wont to wonder whether the custom of wearing gems in jewelry did not originate in the talismanic idea instead of in the idea of mere adornment

In medieval times the influence exerted by precious stones was assumed without question, but when the spirit of investigation was aroused in the Renaissance period, an effort was made to find a reason of some sort for the traditional beliefs. Strange as it may seem to us, there was little disposition to doubt that the influence existed, this was taken for granted, and all of the efforts expended were devoted to finding some plausible explanations as to how precious stones became endowed with their strange and mystic virtues, and how these virtues acted in modifying the character, health, fortunes or fate of the wearer

Autosuggestion possibly affords an explanation of much that is mysterious in the effects attributed to precious stones, for if the wearer be firmly convinced that the gem he is wearing produces certain results, this conviction will impress itself upon his thoughts and upon his very organism. He may really experience the influence, and the effects may manifest themselves just as powerfully as though they were caused by vibrations or emanations from the precious stone

This may serve to explain in the past the persistence of the belief in magic arts

Two or three hundred years ago, a Hungarian woman was accused of having murdered several hundred young girls, and at her trial she confessed that her object was to use the blood of her victims to renew her youth and beauty, for the blood of innocent virgins was supposed to have wonderful restorative and curative properties. In many parts of the world to day there is a superstitious belief that an article of clothing worn by a person, or anything he has habitually used, absorbs some of his individuality. Therefore, a handkerchief, for instance, may be stolen and pinned down beneath the surface of a stream or pond on a toad, the pins marking the names of the enemy, the belief being that as the cloth wastes away so will the body of him who has worn it. In medieval times sorcers made crude wax figures rudely resembling the persons against whom the spell was directed, and then thrust pins into such figures or allowed them to melt away before a slow fire, the enchantment of the sorcerer having supposedly caused some essence of the personalities to enter into the images, and therefore the living and breathing felt sympathetically the effects of the ill treatment inflicted upon their counterfeits. This, doubtless represents the origin of "burning in effigy"

The persistence of the cruel and perverted practices of old-time sorcery is illustrated by the fact that only a few years ago, in Cuba, three women were condemned to death for murdering a white baby so as to use the heart and blood as a cure for disease. It is not surprising that in half-civilized Haiti the Voodoo priests and priestesses demand from time to time a human sacrifice to appease their serpent-god. Several years ago a strange case was exposed in which a stupefying draught, capable of inducing a state of apparent death, was secretly administered to a sick man. When the attending doctor pronounced him dead, he was duly buried, but, two days after, the grave was found open and empty. The Voodoo worshippers had carried the man away so as to revive him and then sacrifice him at their unnatural rites.

Doctor DeBoot, Court Physician to Rudolph II of Germany, in 1609 gave the following opinion regarding the power inherent in gems

"The supernatural and acting cause is God, the good angel and the evil one, the good by the will of God, and the evil by His permission. What God can do by Himself, He could do also

THE ANCIENT MEDICINAL USES OF GEMS AND PRECIOUS STONES \*<sup>1</sup>BY A RICHARD BLISS, JR.<sup>2</sup>

The love of precious stones has always been deeply implanted in the human heart, and the cause of this is found not only in their coloring and brilliancy, but also in their durability. The beautiful colors of flowers and foliage, and even the blue of the sky and the glory of the sunset clouds only last a short time, and are subject to continual change, but the sheen and coloration of precious stones are the same to-day as they were yesterday and will be to-morrow. In a world of change this permanence has a charm of its own that was early appreciated by man.

The object of this paper is to discuss and to illustrate the various ways in which precious stones have been used at different times and among different peoples, and more especially to explain some of the curious ideas and superstitions that have gathered around them. Many of these ideas may seem strange enough to day, and yet when we analyze them we find that they have their roots either in some intrinsic quality of the stones or else in an instinctive appreciation of their symbolical significance. Through manifold transformations this symbolism has persisted to the present day.

Our scientific knowledge of cause and effect may prevent us from accepting any of the fanciful notions of physicians and astrologers of olden times, nevertheless, the possession of a necklace or a ring adorned with brilliant diamonds, fair pearls, warm, glowing rubies or celestial-hued sapphires will make a modern woman's heart beat faster and bring a flush of pleasure to her cheek. Life may seem better worth living to her, and, indeed, life is what our thoughts make it, and joy is born of gratified desire. Nothing that contributes to increasing the sum of innocent pleasures should be disdained, and surely no pleasure can be more innocent and justifiable than that inspired by the possession of beautiful natural objects.

From the earliest times in man's history gems and precious stones have been held in great esteem. They have been found in the monuments of prehistoric peoples, and the civilization of the Pharaohs, of the Incas or of the Montezumas did not alone invest these brilliant things from nature's jewel casket with a significance beyond the mere suggestion of their intrinsic properties.

The magi, the wise men, the seers, the astrologers of the ages gone by found much in the matter of gems that we have almost forgotten. With them each gem possessed certain planetary attractions peculiar to itself, certain affinities with the various virtues, and a zodiacal concordance with the seasons of the year. More over, the early sages were firm believers in the influence of gems in one's nativity, and that the evil in the world could be kept from contaminating a child properly protected by wearing the appropriate talismanic, natal and zodiacal gems. Indeed,

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\* Section on Historical Pharmacy, A. P. H. A., Portland meeting, 1935.

<sup>1</sup> A contribution from the Laboratories of Pharmacology, Howard College of Birmingham Alabama, and the Reelfoot Lake Biological Station at Reelfoot Lake, Tennessee.

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by means of ministers, good and bad angels, who, by special Grace of God and for the preservation of men are enabled to enter precious stones and to guard men from dangers or procure some special grace for them. However, as we may not affirm anything positive touching the presence of angels in gems or to repose trust in them to ascribe undue powers to them is more especially pleasing to the spirit of evil, who transforms himself into an angel of light, steals into the substance of the gem, and works such wonders by it that some people do not place their trust in God but in a gem, and seek to obtain from it what they should ask of God alone. Thus it is perhaps the spirit of evil which exercises its power on us through the turquoise, teaching us, little by little that safety is not to be sought from God but from a gem.

'That gems or stones, when applied to the body, exert an action upon it is so well proven by the experience of many persons, that anyone who doubts this must be called over bold. We have proof of this power in the carnelian, the hematite and the jasper, all of which when applied check hemorrhage. However, it is very necessary to observe that many virtues not possessed by gems are falsely ascribed to them."

In the middle of the seventeenth century Thomas Nichols wrote the prevailing opinion in England at that time as follows

'But it cannot truly be so spoken of gems and precious stones the effects of which are said to be the making of men rich and eloquent, to preserve men from thunder and lightning from plagues and diseases, to move dreams to procure sleep to foretell things to come, to make men wise, to strengthen memories, to procure honors, to hinder fascinations and witchcrafts, to increase friendship, to hinder difference and dissension to make men invisible, as is feigned by the poet concerning Gyges ring, and affirmed by Albertus and others concerning the *ophthalmius lapis* and many other strange things are affirmed by them and ascribed to them, which are contrary to the nature of gems, and which they as they are material, mixed, inanimate bodies neither know nor can effect, by the properties and faculties of their own constitutions because they being natural causes, can produce none other but natural effects, such as are all the ordinary effects of gems that is, such effects as flow from their elementary matter, from their temper, form and essence, such as are the operations of hot and cold, and of all the first qualities such as are hardness heaviness, thickness, color and taste. These are all the natural faculties of gems and these are the known effects of the union of their matter and of the operation of the first qualities one upon another."

Some writers are of the opinion that the hypnotic influences possibly exercised by gems have not been subjected to careful, adequate investigation. The long continued concentration of vision on an object tends to produce a partial paralysis of certain functions of the brain. This effect, it is said, may be observed in the helplessness of a bird when its gaze is fixed upon the glittering eyes of a snake. Likewise, those who gaze for a long period and without interruption on a crystal or glass ball, a diamond or other sparkling gem, may become partially hypnotized or even fall into an hypnotic sleep. Many believe this condition imparts an insight into the future.

During the early part of the eighteenth century Madam Frederike Hauffe, the "Seeress of Prevorst," a woman thought to possess remarkable and unusual clairvoyant powers, gave a series of interesting demonstrations of the effects produced upon a sensitive subject by the touch of minerals and precious stones.

Granite, flint or porphyry did not affect her but fluorspar had a marked effect, relaxing the muscles producing a sour taste (although the substance was simply held in her hand) and inducing at times a somnambulistic state. Barium sulphate produced an agreeable sensation of warmth stimulated the muscles and made the subject feel as though she could fly, long application induced laughter. Rock crystal also stimulated the muscles awakened the subject from sleep and induced an aromatic odor. The diamond produced the same effects. The ruby produced a sensation of coldness in the tongue rendered this organ so heavy that only incoherent

sounds could be made, caused the fingers and toes to become cold, and ultimately induced shivering. These effects, however, were followed by a sensation of elasticity and well being, attended by the fear that a renewal of initial effects might take place.

As hypnotic agents precious stones may induce a physical impression which is heightened by the consciousness of the intrinsic value and the rarity of the substances. The fascination produced by a brilliant, glowing, sparkling, colorful set of jewels is due not only to the beauty of the gems, but largely to the consciousness that they are both rare and valuable objects, and are perhaps eloquent witnesses of love.

The literature as far back as the writings of Pliny describes the talismanic and therapeutic virtues attributed to precious and semiprecious stones. The Alexandrian literature of the second, third and fourth Christian centuries provides a rich source for these superstitious beliefs. In the seventh, eighth and ninth centuries a new literature made its appearance, probably in Asia Minor, and the manuscripts were written largely in Syriac and in Arabic. While this literature was developing in the Mohammedan world, the traditions of Pliny and Solinus were transmitted to the Christian world of the seventh and eighth succeeding centuries by Isidorus of Seville. A remarkable poetical treatise on the virtues of gems and precious stones was written by Marbodius, Bishop of Rennes, at the end of the eleventh century. Saint Epiphanius, Bishop of Constantia, wrote another curious and interesting treatise concerned with the twelve gems on the "Breastplate of Judgment of the High Priest" (E<sub>x</sub> xxviii, 15-21), which is valuable as the first of many attempts to identify the twelve stones. The special virtues of each stone are given also and this treatise may be accepted as the prototype of all the Christian writings on the symbolism of gems.

It is safe to say that, in the case of primitive man, the only attraction offered by precious stones was their color and brilliancy. The infant in his native admiration of what is brilliant and colored undoubtedly represents the mental attitude of primitive man. Probably the first objects chosen for personal adornment were those which were easily strung, for instance, perforated shells and colored seeds. Next came the softer stones wherein holes could be bored by the help of crude tools. The harder gems were valued as attractive toys long before man could adapt them to use as ornaments.

Unquestionably, when these stones had once been worn, there was a disposition on the part of man to attribute certain happenings to their power and influence. Thus there arose a belief in their efficacy, and, ultimately, the conviction that they were abodes of powerful spirits.

It has required centuries of enlightenment to bring us back to the love of precious stones for the esthetic beauty alone. Even to-day we can recognize the power of superstitious belief in the case of the opal, for example, which some timid souls still fear to wear. The coral is worn extensively to-day in Italy as the special charm of childhood, and a protection against the evil eye. Pearls are still dreaded by some and favored by others.

What supersubtle sense is it that leads some women to feel that their jewels partake of human emotion? A French writer, Mme. Catulle Mendès, says that she always wears as many of her rings as possible, because her gems feel slighted when she leaves them unworn. She continues



"I have a ruby which grows dull, two turquoises which become pale as death, aquamarines who look like siren's eyes filled with tears, when I forget them too long How sad I should feel if precious stones did not love to rest upon me!"

The medicinal use of precious stones has been traced to very ancient times. It has been thought that their employment for such purposes was introduced to Europe from India, whence many of the stones were derived. The earliest evidence points rather to Egypt as the first source.

The Ebers Papyrus, for instance, recommends the use of certain astringent substances, such as *lapis lazuli*, as ingredients of eye salves, and hematite, an iron oxide, for checking hemorrhages and for reducing inflammations.

The stones were used medicinally either in talismanic fashion or as mineral substances. In the former case the stones were merely worn on the person, while in the latter case they were reduced to a powder, mixed with wine, water or milk, and then taken internally. The belief in the curative properties of precious stones was at one time universal. It is true that the constituents of certain stones can be absorbed by the body and can produce a definite effect, but the greater part of the elements are so combined that they cannot be assimilated and consequently passed through the system without producing any apparent effect.

In ancient and medieval times the symbolism of color played a very important part in recommending the use of particular stones for special diseases. Thus, in the cases of red or reddish stones, such as the *ruby*, *garnet*, *carnelian* and *bloodstone*, these were thought to be almost infallible remedies for hemorrhages and inflammatory diseases, also to exert a calming influence and to remove anger and discord. In the same way yellow stones were prescribed for the cure of biliousness, jaundice and other diseases of the liver. Green stones were used to relieve diseases of the eye. One of the earliest references in the Greek writings (Theophrastus, who wrote in the third century before Christ) is concerned with the use of the *emerald* for its beneficial effect on the eyes. The *sapphire*, the *lapis lazuli* and other blue stones, possessing the hue of the heavens, were believed to exert a tonic influence, to counteract the spirits of darkness, and to procure the aid of the spirits of light and wisdom. These gems were looked upon as emblems of chastity, and for this reason the sapphire came to be regarded as especially appropriate for ecclesiastical rings. Purple stones, like the *amethyst*, were supposed to counteract the effects of over-indulgence in alcoholic beverages, a use probably suggested by the color of certain wines.

The *diamond* was considered an efficacious antidote for poisons. In the time of Alfonso X this gem was used for diseases of the bladder but only in desperate cases. It was employed also as a protection against plague and pestilence—proof, the plague attacked the poorer classes, sparing the rich who could afford to adorn themselves with diamonds. During the fifteenth century it was even a cure for insanity. In the *Babylonian Talmud* one reads of the marvelous stone belonging to Abraham, perhaps a diamond, possibly a pearl, which cured the sick who looked upon it. The Hindus believed that diamonds of inferior quality were dangerous to use. When Pope Clement XII was seized by his last illness, in 1534, his physicians resorted to powders composed of various precious stones, including diamonds. This stone was used also to detect poisons, for, it was said that on coming in contact with the poison, the diamond grew dark.

Another antidote for poisons and for infected wounds was the *emerald*. It was employed also against demoniacal possession. Worn about the neck it cured "Semitertian" fever and epilepsy. Its uses for relieving eye diseases have been mentioned. The emerald was looked upon as a certain cure for dysentery if one stone was worn in contact with the abdomen, and another placed in the mouth. In the form of a poultice it was used as a remedy for leprosy, and pulverized was administered internally as a powder for hemorrhages. The Hindus of the thirteenth century considered it a good laxative, also as an agent for stimulating the appetite, diminishing the secretion of bile and checking dysentery. Gastric troubles were "cured" by laying the stone on the stomach. The wearer of the stone was protected from the attacks of venomous creatures, and evil spirits were driven from the place where emeralds were kept.

In ancient times the *jade* was considered of great value and aid in parturition. The American Indians used the stone for diseases of the kidneys, and by the middle of the seventeenth century the curative powers of the stone for various forms of renal calculi were generally admitted. In China, jade is still the most favored stone and wonderful therapeutic virtues have been accorded it. An old Chinese encyclopedia (1596) records the uses of jade, when reduced to a powder the size of rice grains, in strengthening the lungs, the heart and the vocal organs, also to prolong life more especially if gold and silver were added to the jade powder. Another method advised by the Chinese was to drink the so-called "Divine Liquor of Jade," made of equal parts of jade, rice and dew-water which were placed in a copper pot, boiled and filtered. This remedy was said to strengthen the muscles and make them supple, to harden bones, to calm the mind, to enrich the flesh and to purify the blood. Whoever took it for a long space of time ceased to suffer from heat or cold, and no longer felt either hunger or thirst. Galen (130 A. D.) attested to the virtues of the *green jasper*, stating that it aids the stomach and navel by contact, and recording his own experiences with the remedy. The stone was used against spiders and scorpions to check the flow of blood to strengthen the chest and lungs, to cure fever and dropsy and to improve the sight.

Sanskrit medical literature, as represented by Naharari, a physician of Cashmere who wrote in the thirteenth century, presents the *ruby* as a valuable remedy for flatulency and biliousness. He writes also of the value of a "Ruby Elixir" if properly compounded, but this elixir seems to have had little in common with the ruby except its color. The ruby was used as an amulet against plague, poison, evil thoughts and nightmare. It was supposed to divert the mind from sadness and sensuality, and to forewarn the wearer of the approach of any misfortune by the loss of color.

William Langley's "Vision of William Concerning Piers the Plowman," written about 1377 and one of the earliest specimens of English literature contains mention of the *sapphire* as a cure for disease. Richard Preston, "a citizen and grocer of London," in 1391, gave a sapphire to the Shrine of St. Erkinwald, in Old Saint Paul's to be kept for the cure of diseases of the eyes stipulating that proclamation should be made of its remedial virtues. It was employed also as an eye-stone for the removal of foreign bodies from the eye to cure plague boils, carbuncles and headaches, to prevent evil and impure thoughts to give color to the cheeks, to provide rest and refreshment for the body, to bestow strength and energy, to soften anger, to free from enchantment and to obtain release from captivity.

St. Hildegard recommended the *topaz* to cure dimness of vision. The stone was placed in wine for three days and nights. On retiring, the patient rubbed his eyes with the moistened topaz so that the moisture lightly touched the eyeball. After the stone had been removed at the end of the third day, the wine was used for

five days A Roman physician of the fifteenth century was reputed to have wrought many wonderful cures of those stricken with the plague, through touching the plague sores with a topaz which had belonged to two Popes, Clement VI and Gregory II The stone was used to cure insanity, check hemorrhage, cure hemorrhoids, to avert sudden death and to restrain anger and desire

The Spaniards and American Indians used the *bloodstone* to check hemorrhages

The best results were supposedly obtained by first dipping the stone in cold water and then holding it in the right hand The Indians carved the stone into heart shaped forms Robert Boyle, in his essay "About the Origin and Virtues of Gems" (London, 1672), tells of a gentleman of his acquaintance who was much afflicted with bleeding of the nose A gentlewoman sent to him a bloodstone directing him to wear it suspended from his neck and from the time he put it on he was no longer troubled with this malady It was thought that this stone rendered one proof against poison endowed with the gift of prophecy brought long life and cured disorders of the stomach

The *pearl* was considered a cure for insanity and other mental diseases, for leprosy and skin diseases, also as a check for bleeding, and an agent to strengthen the body and add lustre to the eye It was conducive to contentment of body and soul By others it was believed unlucky

The idea that the *opal* brings bad luck is based on Teutonic superstition, and is comparatively modern It was valued as a remedy for diseases of the eye, to stimulate the heart, to protect against contagious and infectious diseases, to prevent heart disease and malignant affections and to drive away despondency

The *turquoise* "preserved" the wearer from injury through accident In the presence of poison this stone was reputed to sweat profusely Its color pales as its owner sickens, and is lost entirely on his death, to be recovered only on becoming the property of a healthy person This gem was thought to be particularly effective in diseases of the head and heart

The *amber* was said to change color with the state of the wearer's health, to prevent illness in general, but especially effective against diseases of the throat The *amethyst* was accredited with the power of dispelling sleep, sharpening the intellect, preventing intoxication, protecting against sorcery and bringing victory to soldiers The *coral* was considered a protection against poison, plague, storm, fear, sorcery and evil spirits, by change of color it warned of the approach of diseases

The *beryl* "cured" leprosy and diseases of the throat, jaws and head, it rendered its owner cheerful, and preserved and increased conjugal love The *agate* protects against venomous things, quenches thirst, repels storms, sharpens sight, increases strength, imparts graciousness and eloquence and prevents contagion *Jet* was considered efficacious for removing spells and enchantments The *lode stone* prevents and cures cramps, colic and rheumatism, and is used by voodoo priests as a love charm and to increase physical strength The *moonstone* also is a potent love charm, as well as an aid to memory and a "cure" for leprosy Another "cure" for leprosy is the *onyx*, which in addition was supposed to be a powerful aphrodisiac, to hasten childbirth, to increase the flow of saliva in children, to produce night mares and to stir up strife The *garnet* confers and preserves good health, drives away vain thoughts, reconciles differences between friends and lovers, strengthens the heart and brings wealth and honor The *sardonyx* renders its possessor virtuous, agreeable and cheerful

## PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council

—Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By Law to conflict with the Constitution or By-Laws of this Association "

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter *Please advise us of changes in Roster and mail reports promptly*

### BALTIMORE

The April meeting of the Baltimore Branch AMERICAN PHARMACEUTICAL ASSOCIATION was held on Thursday evening, April 23, 1936, at the School of Pharmacy of the University of Maryland Some sixty odd members and guests were present, the members of the Local Branch being the guests of the faculty of the School on this occasion

An interesting program had been arranged by Dean DuMez, with two speakers scheduled to address the members on timely subjects and with a late luncheon being served at the conclusion of the meeting

The meeting was called to order by President Hewing The minutes of the previous meeting were read by the secretary, and were approved as read

The first speaker to be introduced was Dr Glenn L Jenkins, Professor of Pharmaceutical Chemistry in the School of Pharmacy and a member of the Revision Committee of the National Formulary VI Dr Jenkins spoke on the new National Formulary

In his introductory remarks, Dr Jenkins commented on the part played by pharmacists from Maryland in the preparation of the original and subsequent editions of the National Formulary He recalled that the late Dr Charles Caspari for many years Professor of Pharmacy and Dean of the faculty of the College, had been a member of both the original National Formulary Committee and of the two Committees of Revision of subsequent editions The late Henry P Hynson and H Englehardt were other Baltimoreans on the earlier Committees of Revision

In a brief historical review of the National Formulary it was pointed out that this work was first undertaken by the AMERICAN PHARMACEUTICAL ASSOCIATION as a service to retail pharmacists and had no official or legal status The first official recognition of this work accorded by Congressional enactment came when the fourth edition, published in 1916 was adopted as a book of national standards The speaker expressed the thought that the principal basis for our claim to professional standing to day must rest on the scientific achievements and unselfish professional accomplishments of able pharmacists which are reflected in the pages of the U S P and National Formulary Our progress toward professional ideals and standards through past years has been mirrored in these two volumes

Dr Jenkins sketched the organization set up of the N F Committee the Sub Committees and the Auxiliary Committees engaged in the work of revision, and illustrated the procedure involved in setting up a monograph in the N F The enormous amount of work represented in the revision of a single monograph of this publication as shown by exhibits, caused most of us to revise our ideas regarding the task faced by the Revision Committee Engendered, also was a new appreciation of the value to us of this volume

After discussing the general principles which guided the Committee in its work, and certain changes in scope and policy adopted in the latest revision the speaker took up the question of

admissions to the N F VI The extensive surveys made to determine the extent of actual use of all drugs and preparations proposed for admission were mentioned, and the requirements for admission discussed An interesting feature of this address by Dr Jenkins consisted of numerous charts and tables showing the varying extent of use, over a period of years of the various classes of pharmaceutical preparations which have been included in the U S P and N F These charts were projected on a screen, and trends in use pointed out in connection with his discussion of additions and deletions appearing in the sixth edition of the Formulary

The second speaker of the evening was Mr Marvin J Andrews Assistant Professor of Pharmacy in the School Professor Andrews discussed the present status of 'U S P and N F Propaganda'

Prior to the meeting Professor Andrews had assembled for inspection an extensive array of pamphlets and other printed matter being used in the several states and cities in which localized efforts have been made to popularize and increase the use of U S P and N F drugs and preparations by physicians In discussing these efforts and the results obtained by the several methods of promotion it was pointed out that the methods adopted in Maryland were now being introduced into some other states Numerous inquiries have been received and copies of the printed forms used here are being requested by other pharmaceutical organizations interested in the promotional work being carried on here Actual results obtained in Maryland to date appear to be better than can be demonstrated as attending some of the efforts put forth in other states

The speaker stated that organized promotional efforts are now being carried out in fourteen states, with the probability existing that several other states would join this movement in the near future He also stated that the Maryland Committee of which he is chairman, had arranged for cooperation with a committee from the State Dental Association in promoting interest in prescribing, and the use of U S P and N F products

Informal discussion followed both addresses with the speakers clearing up points for several members

Under the heading of new business President Hewing called for an expression on the part of members as to the advisability of holding a proposed social session during the month of May The consensus of opinions expressed inclined to the view that due to the imminence of other scheduled pharmaceutical gatherings, and Commencement exercises at the School such a meeting might not attract sufficient attendance to prove successful

In the course of above discussion the proposal was advanced by Dr Dunning that future meetings of the Baltimore Branch should all be held at the School of Pharmacy building instead of at the downtown hotel in which meetings have been held for a number of years Dr Dunning recalled the thought which he had expressed at one of the earlier meetings this year when the question of poor attendance was being discussed to the effect that meetings might profitably be made less formal by the inclusion of a supply of some light refreshments to be enjoyed by members at the conclusion of all regular business sessions Such a procedure had helped to popularize the meetings of the local chapter of the American Chemical Society of which he is a member, and might well prove of equal attractiveness to members of the Local A P H A Branch He also renewed his offer to personally donate an amount to cover the added cost of the refreshments served, if this would help to build up the Branch

During the discussion which followed this proposal Dean DuMez stated that a previous invitation to the Branch to make use of the facilities of the School of Pharmacy for its meetings had not been accepted because some members preferred a more centrally located place of meeting but that he was willing to renew the invitation if the membership so desired

On motion of Dr Dunning, which was seconded and carried the members present voted to hold future meetings, for an indeterminate experimental period at the School of Pharmacy building located at Lombard and Greene Streets

No further business being brought up, the meeting was adjourned and members repaired to the dining hall to enjoy the excellent luncheon provided by our hosts R S FUGUA Secretary

#### UNIVERSITY OF MISSISSIPPI STUDENT BRANCH

The University of Mississippi Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION held its April meeting in the entertainment room of the University Cafeteria April 23 1936 On this occasion a joint meeting was arranged with the Oxford Retail Druggists

An informal dinner, which preceded the regular meeting, was tendered by the Branch for the visitors. At this dinner about twenty-five members and visitors were present. The Cafeteria chef provided an excellent dinner which was enjoyed by all those present.

The regular meeting was called to order by President Caver. The minutes of the previous meeting of the A. P. A. Branch were read by the secretary, and approved. C. L. Allred, chairman of the Membership Committee, called a special meeting of that committee Monday.

President Caver presented John Ward, of the Program Committee, who introduced the main speaker of the evening, Dr. J. R. Sims, who gave an interesting talk on "The Relationship between Doctors and Pharmacists." He showed how essential it is that physicians and pharmacists cooperate in every way.

Dr. Sims is well qualified to discuss this subject since he holds a pharmaceutical degree as well as that of M. D. He has had experience in both phases, having practiced and taught both medicine and pharmacy.

Peyton Jones distributed cigars, and wit added zest to the occasion.

MIDDLETON LONGMIRE, *Secretary*

#### COMMITTEES OF THE UNIVERSITY OF MISSISSIPPI STUDENT BRANCH

*Program Committee*—Joe Duckworth, *Chairman*, John Ward, George Furr, *Student*

*Activities Committee*—William Hossley, *Chairman*, Lee Turnage, L. A. Eaton

*Membership Committee*—C. L. Allred, *Chairman*, O. C. Grigsby, George Kealhofer

#### NEW YORK

The May meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on Monday evening, May 11, 1936 at Columbia University, College of Pharmacy.

The meeting was called to order at 8:30 P. M. by President Schaefer.

The minutes of the preceding meeting were read and approved.

The Committee on Membership presented the following applications for membership in the Branch:

Bernard Greenberg

George Schroder

Jack Feldman

J. J. Franz

Frank Rapecis

Raphael Tomshinsky

Louis Block

Sam Weiss

Henry Jansen

Philip Steir

J. J. Hammer

Treasurer Currens reported a balance.

Chairman Lehman, of the Committee on Legislation and Education, reported as follows:

"Members are requested to send telegrams to State Senator Dunnigan urging the passage of the Feld Bill entitled 'An Act to Prevent Prohibitory Price Cutting.' Also to Speaker Ives to pass the 'Piper Bill' a companion to the above.

"Also to Speaker Ives urging the passage of the 'Dunkel Bill' to prevent the sale at wholesale to retailers who are not qualified to sell drugs having poisonous, habit-forming or deleterious qualities."

Chairman Steger, of the Committee on the Progress of Pharmacy, reported as follows:

On Friday night, May 8th, Dr. Lyman C. Craig, of Rockefeller Foundation, read a paper on 'The Alkaloids of Ergot' at the A. C. S. meeting.

In the May 1936, *Ind. and Eng. Chem.* appears a most interesting article on "Germicidal Properties of Phenolic Compounds" by Cecil G. Dunn. The following compounds were studied and compared with eight other germicidal solutions: *sec*-Amyltri-cresol, *o*-hydroxyphenylmercuric chloride and a mixture of the two known as mercresol.

*The Chemist and Druggist*, April 4, 1936—a short notice of the celebration in London on March 30th, of a "cosmetic centenary."

U. S. Patents have been issued for the following: a new uric acid solvent made by reacting a trihalogen acetic aldehyde with nitric acid.

Alkyl ethers of 4-chloro resorcinol assigned to Lambert Pharmacal Co

A process for converting alkali salts of phenyl alkyl barbituric acid into stable calcium compounds

A compound for treatment of anemia comprising a neutralized solution of a highly soluble ferrous salt in water and glycerin, assigned to Chappel Bros

A dried inorganic gel for internal use for treatment of toxemia, assigned to Davidson Chemical Co

A practically tasteless quinine, compound The 2,3 dihydroxy naphthalene *o* monoacetate of quinine Assigned to Hoffmann La Roche Co

The secretary reported on a meeting of the Executive Committee The presentation of the Remington Medal was discussed It was decided to make the award at a banquet on June 9, 1936, if possible The secretary was appointed as chairman of the committee in charge

The president appointed Mr Maistelman as chairman of a committee to study the question of ways and means of increasing attendance at the regular meetings

The president then introduced the guest speaker of the evening Mr Saul Caspe, associate director of Research Philip Morris Co, Ltd, who spoke on "The Influence of Hygroscopic Agents on Irritation from Cigarette Smoke"

The talk was a report on the results of research work performed in the laboratories of Columbia University

The most commonly used hygroscopic agent is glycerin The burning of glycerin, however, forms among other products, a highly irritating and toxic substance Another hygroscopic agent is diethylene glycol

The irritant properties of smoke from cigarettes treated respectively with glycerin and diethylene glycol were studied A smoking machine was so constructed as to duplicate normal smoking conditions The smoke from the cigarette is bubbled through a suitable liquid To compare the irritant properties of the smoke some of this solution is injected into one eye of a rabbit The resulting edema of the conjunctiva of that eye gives a measure of the irritant properties of the smoke Based on a large number of experiments, the conclusion was reached that cigarettes in which diethylene glycol was used as the hygroscopic agent were much less irritating than cigarettes in which glycerin was used

These tests were repeated, using several brands of cigarettes on the market with the same result that is, the edema produced by glycerin treated cigarettes was substantially the same regardless of method of manufacture

Clinical investigations were conducted by a number of doctors, of whom the majority were nose and throat specialists A large number of trustworthy subjects were selected, each of whom was suffering from congestion of the nose, throat, mouth or lungs In every case the patients had been smoking glycerin treated cigarettes They were taken off their habitual cigarettes and given cigarettes in which diethylene glycol was used as a hygroscopic agent Periodic examinations were made until the congestion had improved or cleared up Then the patients were given a new supply of cigarettes exactly the same in all respects except that they were glycerin treated instead of diethylene glycol treated The patients were unaware of the change The results were conclusive, while using diethylene glycol treated cigarettes a definite improvement was obtained On returning to the glycerin treated cigarettes, in most cases, there was a quick return to the congested condition

In conclusion it was stated that 'Tests on rabbits' eyes and a man's nose throat mouth and lungs showed conclusively that the irritation caused by smoke from diethylene glycol treated cigarettes is much less than that from glycerin treated cigarettes

After the speaker had finished his address, there was quite a discussion among the members on this subject Finally a rising vote of thanks was accorded the speaker and the meeting adjourned

HORACE T F GIVENS, *Secretary*

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Authors of papers for the meeting in Dallas will please send in titles and abstracts promptly

# ASSOCIATION BUSINESS

## AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1935-1936

Office of the Secretary, 2215 Constitution Ave , Washington, D C

### LETTER NO 22

May 22 1936

*To the Members of the Council*

140 *Use of Text of N F VI* Motion No 63 (Council Letter No 21, page 471) has been carried and Dr Sugar has been so advised •

Messrs Lea and Febiger have requested permission to use the text of the N F VI in a revised edition of Prof Charles H Roger's book on pharmaceutical chemistry Chairman DuMez writes as follows

"In response to your letter of the 14th, it is stated that I have gone over the proof sheets of the revised edition of Professor Roger's book on pharmaceutical chemistry which you sent me I find that the book is not materially changed from the original and therefore recommend to the Council that he be granted permission to use portions of the text of the N F VI for comment, and that the same fee be charged as before "

(*Motion No 67*) It is moved by DuMez that Lea and Febiger be granted permission to use portions of the text of the N F VI in a revision of a book on pharmaceutical chemistry by Charles H Rogers with the customary acknowledgment and at the usual fee of \$5 00

141 *Corrections in N F VI* Motion No 64 (Council Letter No 21, page 472) has been carried and arrangements have been made with Mack Printing Company for the printing and distribution of the list and for corresponding corrections in the plates before the second printing of N F VI

142 *Election of Members* Motion No 65 (Council Letter No 21, page 472) has been carried and applicants for membership numbered 336 to 349 inclusive, are declared elected

143 *Request for Additional Compensation on Account of Printing and Binding the N F VI* A vote is called for on Motion No 66 (Council Letter No 21, page 472)

Dr Fischelis commented, and very correctly so, that any agreement to pay any sum in excess of the contract should be paid with the understanding that if during the term of the contract there are any reductions in cost, the ASSOCIATION should be credited with the decreases

The contract provides for such adjustments, either higher or lower and the prices including labor and materials will be checked as each printing of N F VI is billed The additional compensation requested in this instance applies only to the first printing of 25 000 copies and does not change the terms of the contract or the specifications thereunder

Dr Dunning, although in favor of paying the additional compensation under the circumstances, inquired whether a decrease in compulsory wage would be credited to the ASSOCIATION

No other comments were received

144 *Stock of N F VI* The secretary checked the report of the Mack Printing Company covering the first printing of N F VI, on May 19th in Easton, Pa 25 101 copies were printed, 21,567 copies had been sold, and 3534 copies were in stock with either the five sub distributors, the binders or the Mack Printing Company, as covered by proper certificates 25,000 copies were billed on January 16th and the over run of 101 copies or less will be billed when it is determined how many copies, if any, are damaged

145 *Committee on Pharmacy Week* Chairman Hogstad appeared before the Council at its meeting on December 5 1935, and discussed certain proposed modifications in the plan for Pharmacy Week (see Council Letter No 10, page 1110) at which time he was requested to give the proposals further consideration and to submit them by mail at a later date

Attached is a Suggested Plan for the Reorganization of the Pharmacy Week Movement and an accompanying letter as submitted by Chairman Hogstad



With respect to

*Recommendation No 2*—The National Association of Retail Druggists has increased its 1936 appropriation for the Committee on Pharmacy Week to \$500 00 (from \$250 00) to match an equal increase by the A P H A which provides the amount requested

*Recommendation No 8*—Arrangements have been made to take care of correspondence and filing, as proposed

*Recommendation No 11*—Arrangements have been made with the N A R D to prepare and issue jointly the ten Merit Certificates for retail pharmacists awarded for the 1935 Contest

In order to bring the Suggested Plan before the Council, the following motion is offered and the members are invited to forward comments and suggestions as promptly as possible These will be submitted in letter form and a vote on the motion will be called for later

*(Motion No 68)* It is moved by Kelly that the Suggested Plan for the Reorganization of the Pharmacy Week Movement, as submitted by Chairman Hogstad, be approved

*146 Applicants for Membership* The following applications, properly endorsed and accompanied with the first year s dues have been received

No 350, Frank H Overton 4648 Hollywood Blvd Hollywood, Calif , No 351, Virgil Gordon Smider, Campana Corp , Batavia, Ill , No 352, Joseph August Gauer, Fritzsche Bros , Inc Chicago Ill , No 353, Edward Rosendahl, 148 Lafayette St , New York, N Y , No 354 Agostino Caimi, 2030 E Willard St Philadelphia Penna , No 355, John Willard Jester, 6117 Fairhill St , Philadelphia, Pa , No 356 Bert S Kleinsinger, 2601 Jerome Ave , Bronx N Y C , No 357 James Hing Chu 47 Mott St , New York N Y , No 358 Evelyn Leone Wall, 114 So 7th East St Salt Lake City, Utah, No 359, Marion S Alley, 1926 Eye St , N W , Washington D C , No 360 Tony Joseph Rosetti Box 156, University, Miss

*(Motion No 69)* Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION

E F KELLY, *Secretary*

BULLETIN NO 12, 1935, 1936

May 18, 1936

#### CORRECTIONS IN THE N F VI

Since the National Formulary, Sixth Edition, was issued in December 1935, many interested persons have read the book very critically, and quite a number of corrections in the text have been suggested

These proposed corrections included simple typographical errors a few errors in the tolerance figures for the alcoholic content of certain galemlcal preparations and a few changes in dose statements

The Committee on National Formulary has given each of the suggestions very careful consideration and has compiled a list of 54 corrections to be made in the first printing of the N F VI, bearing official coupons with serial numbers from 100,001 to 125,000 The corrections have been approved by the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION and will be made in subsequent printings of the N F VI

A list of these corrections, printed on one side of the sheet, is available, without cost, and is so arranged that the sheets can be inserted in the front of the N F VI, or that each correction can be cut out and pasted over the wording it is to replace

Requests for the list of Corrections in the N F VI may be sent to Mack Printing Company Easton, Penna , or to the AMERICAN PHARMACEUTICAL ASSOCIATION, 2215 Constitution Avenue Washington, D C , and *must be accompanied by a self addressed stamped envelope* to insure delivery

E F KELLY, *Secretary*

#### NATIONAL PHARMACY WEEK EXECUTIVE COMMITTEE

*To the Members of the Council of the American Pharmaceutical Association*

Attached is a suggested plan for the reorganization of the National Pharmacy Week Movement At the request of Dr E F Kelly, I presented a suggested plan at the December meeting of the Council The present suggested plan is a modification of the plan as submitted at that time in which it will be noted that several of the features that were somewhat controversial in character have been eliminated

In view of the fact that the time has arrived for issuing a release to the pharmaceutical press, I shall deem it a great favor if you will kindly advise as to the action of the Council on the plan as submitted at this time

ANTON HOGSTAD, JR., *Chairman,*  
National Pharmacy Week Executive Committee

## SUGGESTED PLAN FOR THE REORGANIZATION OF THE NATIONAL PHARMACY WEEK MOVEMENT

### INTRODUCTION

The National Pharmacy Week Movement as founded by the late Dr Robert J Ruth, celebrated its eleventh annual observance during the week of October 21, 1935 During the course of the past eleven years the chairmanship of this movement has been held by Robert J Ruth, E L Newcomb and Anton Hogstad, Jr

The question as to whether the National Pharmacy Week Movement should be continued in the future has been raised quite frequently by educators, retail pharmacists, association officers and others This has received serious consideration by the National Pharmacy Week Executive Committee and the Committee feels that the Movement should be continued in the future In spite of many handicaps the Movement has accomplished a great deal in the past and it would appear to offer many opportunities for the future, provided certain changes are made in its set up

During the first two or three years thousands upon thousands of retail pharmacists took an active part in the observances of the National Pharmacy Week Movement Many of these individuals, however, conducted highly commercialized drug stores and they did not have a love of the profession at heart They were only interested in securing the local, state and national prizes After making two or three unsuccessful attempts, they lost interest and ceased to participate in the Movement

There has been, therefore, during the past eleven years, a distinct settling process taking place, wherein one notes that those individuals who possess a love of the profession at heart and who are not particularly interested in prizes have taken a very active interest This has been especially noticeable in the past two or three years, which, according to all reports, have been quite outstanding The National Pharmacy Week Executive Committee is satisfied with these conditions for the future of the Movement depends upon the support of the professionally inclined pharmacists

The Committee believes that our colleges of pharmacy should take an active interest in the Movement in order to give it an academic atmosphere It is very gratifying to note the cooperation of the deans in conducting "Open House" during Pharmacy Week, in presenting community and radio talks and in other activities A number of colleges of pharmacy have prepared attractive professional window displays which have been featured in public libraries and in prominent community windows

It has been deemed advisable in the light of these facts to make certain changes in the set up of the National Pharmacy Week Movement and a discussion of the proposed modifications follows for your consideration

*Recommendation No 1—Name*—That the present name, "National Pharmacy Week," be retained

Many suggestions have been received relative to a possible change of name, as many object to including the word "week" It is felt, by some that the retention of the word "week" identifies the Movement as just another week among a score of annual observances participated in by many groups

It is our opinion, however, that the present name should be retained, for it has been firmly established in the minds of the drug trade industry and its disadvantages can be offset, at least in part, by a constructive program

*Recommendation No 2—Finances*—The chairman of the National Pharmacy Week Executive Committee recommended in his report presented at the 1935 Convention of the AMERICAN PHARMACEUTICAL ASSOCIATION that the sum of \$1000 00 be furnished the Committee annually to carry on the work of the National Pharmacy Week Movement To date this Committee has received but \$500 00 per year, which has been found quite inadequate

Many persons have suggested that a fund be established by appealing to manufacturers but this has been deemed inadvisable

*Recommendation No 3—National Pharmacy Week Executive Committee Membership*—That the president of the AMERICAN PHARMACEUTICAL ASSOCIATION appoint a committee of seven members including two representatives of the National Association of Retail Druggists to continue to be known as The National Pharmacy Week Executive Committee "

*Recommendation No 4—International in Scope*—That the AMERICAN PHARMACEUTICAL ASSOCIATION through its National Pharmacy Week Committee encourage pharmaceutical associations throughout the world to observe an annual Pharmacy Week During the next few months the chairman of the Committee will enter into correspondence with the presidents or secretaries of all foreign pharmaceutical associations to ascertain whether or not these associations sponsor Pharmacy Week movements and if not will encourage them to do so

*Recommendation No 5—Stationery*—That the National Pharmacy Week Committee employ the official stationery of the AMERICAN PHARMACEUTICAL ASSOCIATION, with such modifications as are deemed necessary relative to the names of committees etc and that the names of foreign pharmacy week committees be included on the Pharmacy Week stationery

*Recommendation No 6—National Pharmacy Week Executive Office*—That the activities of the National Pharmacy Week Executive Committee be conducted from the AMERICAN INSTITUTE OF PHARMACY at 2215 Constitution Avenue Washington D C instead of from the present office at Rahway New Jersey At the present time it is indicated on the stationery that the office is at 2215 Constitution Avenue and all correspondence is relayed to Rahway New Jersey

*Recommendation No 7—Fund for Executive Office*—That the President of the AMERICAN PHARMACEUTICAL ASSOCIATION appoint a committee of five to raise a fund for the purpose of furnishing this office

*Recommendation No 8—Part Time Secretary for Executive Office*—That the AMERICAN PHARMACEUTICAL ASSOCIATION provide the National Pharmacy Week Committee with necessary secretarial service to attend to correspondence and filing in the Pharmacy Week Office

*Recommendation No 9—Window Display Contest*—That the National Pharmacy Week Window Display Contest be continued in the future in accordance with the suggestions set forth under Rules of Contest "

*Recommendation No 10—Prizes*—That three prizes be offered in connection with the National Pharmacy Week Window Display Contest as follows

1 Federal Wholesale Druggists Association Robert J Ruth Memorial Trophy for the best professional window display prepared and featured by a retail pharmacist

2 An attractive banner and stand presented by the AMERICAN PHARMACEUTICAL ASSOCIATION for the best professional window display prepared and featured by a local county or state pharmaceutical organization

3 An attractive banner and stand presented by the AMERICAN PHARMACEUTICAL ASSOCIATION for the best professional window display prepared and featured by a reputable school or college of pharmacy

*Recommendation No 11—Merit Certificates*—That the practice of the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists of awarding merit certificates jointly for the ten next best window displays prepared by retail pharmacists be continued with three additional certificates for the three next best displays prepared by local county or state pharmaceutical organizations and three certificates for the three next best displays prepared by reputable schools or colleges of pharmacy

*Recommendation No 12—Advisory Committee*—That the present Advisory Committee consisting of the presidents and secretaries of state pharmaceutical associations be retained

*Recommendation No 13—Cooperating Groups*—That the following groups cooperate with the National Pharmacy Week Executive Committee

- 1 National Association of Retail Druggists
- 2 American Association of Colleges of Pharmacy
- 3 National Conference on Pharmaceutical Research
- 4 National Association of Boards of Pharmacy
- 5 National Wholesale Druggists' Association

- 6 Federal Wholesale Druggists' Association
- 7 American Pharmaceutical Manufacturers' Association
- 8 American Drug Manufacturers' Association
- 9 Editors of United States Pharmaceutical Journals

*Recommendation No 14—Presidential Broadcast*—That the President of the AMERICAN PHARMACEUTICAL ASSOCIATION deliver an annual Pharmacy Week message over a national hook-up on the Saturday or Sunday evening prior to the inauguration of Pharmacy Week, it being understood that the arrangements for this broadcast will be made by the Chairman of the National Pharmacy Week Executive Committee

*Recommendation No 15—Pharmaceutical Press*—That the pharmaceutical press be asked to continue the splendid support it has furnished the National Pharmacy Week Movement in the past and that editors be encouraged to issue special Pharmacy Week issues of pharmaceutical journals

*Recommendation No 16*—That the National Wholesale Druggists' Association be encouraged to prepare and distribute Pharmacy Week Maps as they have been doing in former years

*Recommendation No 17—Professional in Character*—That members of the drug trade fraternity, through the agency of bulletins, pharmaceutical press, talks, etc., be urged to keep the Pharmacy Week Movement strictly professional at all times

*Recommendation No 18—Radio Committee*—That the president of the AMERICAN PHARMACEUTICAL ASSOCIATION appoint a committee of three members to be known as the AMERICAN PHARMACEUTICAL ASSOCIATION Radio Committee, the purpose of the committee being to make a study of radio programs, especially those in connection with the Pharmacy Week Movement and to prepare a constructive report on pharmaceutical radio programs

*Recommendation No 19—Pharmacy Week Exhibit at Conventions of the American Pharmaceutical Association*—That the chairman of the National Pharmacy Week Executive Committee appoint a committee whose duty shall be to prepare a professional exhibit, to be known as the "Pharmacy Week Exhibit" at the annual conventions of the AMERICAN PHARMACEUTICAL ASSOCIATION

*Recommendation No 20—Pharmacy Week Brochure*—That the National Pharmacy Week Executive Committee prepare and distribute a Pharmacy Week booklet containing necessary information relative to the annual observance

*Recommendation No 21—Monthly National Pharmacy Week Bulletin*—That the National Pharmacy Week Executive Committee prepare and release to the pharmaceutical press monthly mimeographed bulletins to encourage retail pharmacists to greater professional activity and to inform them of matters pertaining to the Pharmacy Week Movement

*Recommendation No 22—Pharmacy Week Human Interest Appeal Stories*—That owing to the wide spread interest in the mimeographed human interest appeal stories as released by the National Pharmacy Week Executive Committee in the past the Committee enlarge upon this phase of Pharmacy Week activities by increasing the number of these stories and by charging 5¢ per copy post paid, if found necessary

*Recommendation No 23—State, County and Local Pharmacy Week Committees*—That the National Pharmacy Week Executive Committee arrange for state county and local Pharmacy Week committees through state, county and local pharmaceutical organizations

*Recommendation No 24—Newspaper Editorials*—That the National Pharmacy Week Executive Committee arrange for the preparation and distribution of a series of editorials relative to Pharmacy Week for daily and weekly newspapers

*Recommendation No 25—High School Essay Contests*—That the National Pharmacy Week Executive Committee encourage high school essay contests throughout the United States and that a Pharmacy Week Essay Contest Committee be appointed by the Chairman of the National Pharmacy Week Executive Committee

*Recommendation No 26—Greetings to Associations Assembled in Conventions*—That night letters be telegraphed to secretaries of the following associations when in convention to extend greetings and to stimulate interest in Pharmacy Week activities

- 1 National Association of Retail Druggists
- 2 National Association of Wholesale Druggists
- 3 Federal Wholesale Druggists' Association
- 4 American Pharmaceutical Manufacturers' Association
- 5 State Pharmaceutical Associations
- 6 American Drug Manufacturers' Association

*Recommendation No 27—Rules of Contest—Rule No 1* The Contest is open to the following

Class I—Retail pharmacists who are proprietors of one or more retail drug institutions maintaining prescription departments

Class II—Local county and state pharmaceutical associations

Class III—Colleges of pharmacy

*Rule No 2* Class I—The display must be featured by a proprietor of a retail pharmacy maintaining a prescription department The display must be featured in one of the window display spaces

Class II—The display must be exhibited in a prominent and suitable display space which is not maintained by a member or members of the drug-trade fraternity such as retail drug stores and wholesale drug houses

Class III—The display must be featured in a prominent and suitable display space which is not maintained by a member or members of the drug trade fraternity such as retail drug stores and wholesale drug houses

*Rule No 3* All displays must be strictly professional depicting one or more aspects of the profession of pharmacy, i e the romance of pharmacy, scientific achievements, pharmacy in relation to public health pharmaceutical education and the pharmacist and the law

*Rule No 4* The display must be conceived and developed by or under direction of the individual or group entering it in the contest

*Rule No 5* A photograph of any display previously submitted in a local, county, state or national Pharmacy Week contest will be declared ineligible

*Rule No 6* Displays should be as free as possible from advertising material and trade packages and will be judged accordingly

*Rule No 7* A photograph or photographs of displays should be as free as possible from commercial advertisements either on the interior or exterior of the institution

*Rule No 8* Photographs submitted should be, if possible 8 x 10 inches in size and should be made by a commercial photographer

*Rule No 9* All photographs submitted will become the property of the AMERICAN PHARMACEUTICAL ASSOCIATION for its historical records No photographs will be returned.

*Rule No 10* Photographs will be judged according to the following points

(a) Interpretative thought	10 points
(b) Human interest appeal	10 points
(c) Balance harmony, color scheme	10 points
(d) Educational value	10 points
(e) Professional value	10 points
(f) Conciseness and clarity of expression	10 points
(g) Value to pharmacy from allied professional point of view	10 points
(h) Originality	10 points
(i) Technical accuracy	10 points
(j) Ownership of materials	10 points

Possible Total

100 points

*Rule No 11* Photographs should be accompanied by a letter of transmittal on the stationery of the contestant and the letter should bear the signature of the contestant

*Rule No 12* Class I—Photographs and letter of transmittal should be mailed to the secretary of the respective state pharmaceutical association on or before November 15th of the current year

Class II—Photographs and letter of transmittal should be mailed to the secretary of the respective state pharmaceutical association on or before November 15th of the current year

Class III—Photograph and letter of transmittal should be mailed to the secretary of the respective state pharmaceutical association on or before November 15th of the current year

*Rule No 13* Photographs of displays entered in the contest should not appear in the pharmaceutical press until the report of the Contest Committee is announced by the chairman of the National Pharmacy Week Executive Committee

ANTON HOGSTAD, JR, *Chairman,*

National Pharmacy Week Executive Committee

*Concluded from page 460, May Journal, A Ph A*

TABLE FOR ADJUSTMENT OF ISO-ALCOHOLIC ELIXIR, N F VI \*<sup>1</sup>

Low Alcoholic Elixir	High Alcoholic Elixir	Suitable as Vehicle for Preparations of the Following Alcoholic Strengths
1 volume	None	0-10 per cent
4 volumes	1 volume	10-20 per cent
3 volumes	1 volume	20-30 per cent
2 volumes	1 volume	30-40 per cent
1 volume	1 volume	40-50 per cent
1 volume	2 volumes	50-60 per cent
1 volume	3 volumes	60-70 per cent
1 volume	4 volumes	70-80 per cent
None	1 volume	80-95 per cent

\* For Prescription department

<sup>1</sup> Issued by the U S P-N F Publicity Committees of the Maryland Pharmaceutical Association and Baltimore Retail Druggists' Association

**NOTE** Iso Alcoholic Elixir is intended to serve as a general vehicle for various medications that require solvents of different alcoholic strengths. When, therefore, Iso-Alcoholic Elixir is specified in a prescription, that proportion of its two ingredients is to be used that will produce a perfect solution.

*For liquid galenicals*, the alcoholic strength of Iso Alcoholic Elixir to be used is approximately the same as that of the menstruum or solvent employed in the preparation of the galenical.

*When galenicals of different alcoholic strengths are used in the same prescription*, the Iso-Alcoholic Elixir to be used is to be of such alcoholic strength as to secure the best solution possible under the circumstances. This will generally be found to be the average of the alcoholic strengths of the several ingredients.

*For non extractive substances*, the lowest alcoholic strength of Iso-Alcoholic Elixir that will yield a perfect solution should be chosen.

ALCOHOLIC STRENGTH OF FREQUENTLY USED FLUIDEXTRACTS, SPIRITS AND TINCTURES

Fluidextractum	U S P Fluidextracts Alcoholic Content.	Average Dose
Cannabis	75-85%	0 1 cc - 1½ minims
Cascara Sagradae	20-24%	1 cc - 15 minims
Cascara Sagradae Aromaticum	17-19%	2 cc - 30 minims
Ergotae	37-42%	2 cc - 30 minims
Glycyrrhiza	20-24%	2 cc - 30 minims
Ipecacuanhae	28-33%	0 06 cc - 1 (Expectorant)
		1 cc - 15 (Emetic)
Sarsaparillae	37-42%	2 cc - 30 minims
Zingiberis	69-76%	0 6 cc - 10 minims
Fluidextractum	N F Fluidextracts	
Aconiti	60-66%	0 06 cc - 1 minim
Belladonnae Folii	57-63%	0 06 cc - 1 minim

Buchu	71-78%	2 cc - 30	minims
Cimicifugæ	71-78%	1 cc - 15	minims
Colchici Cormi	51-57%	0.25 cc - 4	minims
Colchici Seminis	53-58%	0.2 cc - 3	minims
Gossypii Radicis Corticis	71-78%	2 cc - 30	minims
Grindeliæ	57-63%	2 cc - 30	minims
Hydrastis	51-57%	2 cc - 30	minims
Hyoscyami	57-63%	0.2 cc - 3	minims
Lobeliæ	36-42%	0.1 cc - 1 1/4	minims
Rhei	55-63%	1 cc - 15	minims
Sarsaparillæ Compositum	32-38%	2 cc - 30	minims
Senegæ	51-57%	1 cc - 15	minims
Valerianæ	61-68%	1 cc - 15	minims
Viburni Opuli	51-57%	2 cc - 30	minims

Tinctura	U S P Tinctures		
Aconiti	65-70%	0.6 cc - 10	minims
Belladonnæ	65-70%	0.6 cc - 10	minims
Capsici	80-85%	0.5 cc - 8	minims
Cardamomi Composita	45-47%	4 cc - 60	minims
Cinchonæ Composita	56-62%	4 cc - 60	minims
Colchici Seminis	59-63%	2 cc - 30	minims
Digitalis	67-72%	1 cc - 15	minims
Ferri Chloridi	58-64%	0.6 cc - 10	minims
Gentianæ Composita	43-47%	4 cc - 60	minims
Hyoscyami	65-69%	2 cc - 30	minims
Nucis Vomicae	67-72%	1 cc - 15	minims
Opii	17-19%	0.6 cc - 10	minims
Opii Camphorata	43-46%	4 cc - 60	minims
Rhei Aromatica	43-46%	4 cc - 60	minims
Scillæ	64-67%	1 cc - 15	minims
Stramonii	64-70%	0.75 cc - 12	minims
Valerianæ	66-70%	4 cc - 60	minims

Tinctura	N F Tinctures		
Aloes	44-48%	2 cc - 30	minims
Asafoetidæ	78-85%	1 cc - 15	minims
Calumbæ	58-62%	4 cc - 60	minims
Cannabis	85-90%	1 cc - 15	minims
Cimicifugæ	79-85%	4 cc - 60	minims
Gelsemii	70-75%	0.3 cc - 5	minims
Guaiaci	78-82%	4 cc - 60	minims
Guaiaci Ammoniatæ	58-64%	2 cc - 30	minims
Hydrastis	57-63%	8 cc - 120	minims
Lobeliæ	44-47%	1 cc - 15	minims
Sanguinariæ	66-72%	1 cc - 15	minims
Strophanthi	88-92%	0.5 cc - 8	minims
Valerianæ Ammoniatæ	62-65%	2 cc - 30	minims

Spiritus	U S P Spirits		
Æthylis Nitritus	85-93%	2 cc - 30	minims
Ammoniac Aromaticus	62-68%	2 cc - 30	minims
Camphoræ	80-87%	1 cc - 15	minims
Chloroformi	85-91%	2 cc - 30	minims
Glycerilis Trinitratis	88-95%	0.06 cc - 1	minim
Menthæ Piperitæ	79-85%	1 cc - 15	minims
Menthæ Viridis	79-85%	1 cc - 15	minims

Spiritus	N F Spirits		
Ætheris	60-65%	4 cc - 60	minims
Ætheris Compositus	58-63%	4 cc - 60	minims

### THE INTERNATIONAL PHARMACEUTICAL FEDERATION MEETING OF THE BUREAU

Meetings of the International Committee on Specialties and of the International Pharmaceutical Federation were held at Cambridge (England) during the last week of May, nine countries were represented by delegates. We are taking the liberty of abstracting from the report in the *Pharmaceutical Journal* of June 6th.

Chairman L. van Itallie presided over the three sessions of the Commission on Specialties. A new edition of the treatise on methods of analysis of proprietary medicines is to be published in German, another volume on a scheme for carrying out the methods of analysis is under con-



Left to Right Mrs Rising (Stockholm) Mme Høst Madsen, M G Barthet (Paris), Prof L van Itallie (Leyden), Dr T Potjewijd (The Hague), Mme Heressey, Prof Dr H Heressey (Paris) Mr E Saville Peck, Dr J J Hofman (The Hague), Dr E Høst Madsen, President (Copenhagen), Dr A Schmierer (Berlin), Herr Genicker, Mme Chalmeta, Dr Weiss (Vienna), Prof Chalmeta (Madrid) —*The Pharmaceutical Journal*

sideration, the Commission also agreed to compile information on research which had been done on thermostability of chemicals used for injection.

President Dr Host Madsen presided at the sessions of the Bureau, the work accomplished and that for future investigations was discussed. "Dispensatorium Danicum," of Danish pharmacists, is issued to doctors as a guide to prescribing galenicals and pharmacopœial chemicals.

The Bureau has obtained information on the practice of pharmacy and now will investigate the legal responsibilities of the pharmacists and the practice in countries represented in the Federation. The 25th anniversary meeting of the Federation will be held in Copenhagen in August or September of 1937.

### PENNSYLVANIA ASSOCIATION

The Association met in Philadelphia at the Bellevue Stratford, an extensive exhibit was a feature. Among the speakers were Mercer B Tate, Jr, on "Fair Trade and Its Legal Aspects," Edward J Hughes on "Diversity in the Practice of Pharmacy," E Fullerton Cook on "U S P XI, and Relationship to Other Books of Standards," Noel E Foss on "Chemical Phases That Pharmacists Should Know Regarding New Pharmacopœial Products," Adley B Nichols, on "Scope and Value of the National Formulary to the Practicing Physician and Dentist," Louis Saalbach on "Value of the

National Formulary to the Pharmacist," H Evert Kendig, on "Practical Uses of the U S P and N F from the Viewpoint of the Physician," Rowland Jones on "National Legislation."

A series of valuable papers and a symposium on Vitamins featured the annual event.

President Harry E Wertz presided at the banquet, Dr Wilmer Krusen was toast master and Congressman Wright Patman, speaker of the occasion. Guests of Honor were Mayor Davis Wilson, Chief Justice John W Kephart, Mrs Lucretia Blankenburg, Robert P Fischels, Rowland Jones Jr, E F Kelly, Mercer B Tate Jr, George C Yeager.



## EDITORIAL NOTES

### SENATE BILL 4390 NOW ON CONSENT CALENDAR

The *Calendar* of June 18th reports that S 4390 has been placed on the "Consent Calendar" and it is reasonable to assume that the Bill which provides commissions for 16 pharmacists will be enacted before the close of Congress. This is a forward step in the advancement of pharmacists for which the AMERICAN PHARMACEUTICAL ASSOCIATION has been working for years. See April JOURNAL page 380 May number, pages 477 478 and 479.

The Sheppard Bill was finally passed on June 19th. It provides as stated, for commissioning 16 graduate pharmacists as second lieutenants.

The Robinson-Patman Bill was passed and signed by the President.

In the closing rush of Congress (June 20th) the Food and Drugs Bill was killed when the House refused to agree to the conference report. The battle for passage of the legislation was led by Chairman Rayburn (Texas) of the Interstate Commerce Committee.

The AMERICAN PHARMACEUTICAL ASSOCIATION restated its belief at Portland that the present food and drugs act is too limited in its scope to afford the public the proper protection in the matter of food and drugs and cosmetics and that the ASSOCIATION endorse the bill now before Congress known as S-5 substantially in the form in which it passed the Senate and urge its prompt enactment, and its officers are instructed to cooperate as fully as possible with all other agencies having this end in view and that a copy of this resolution be immediately sent to the chairmen of the committees having the bill in charge. Every effort in that direction was made by the ASSOCIATION to secure enactment which failed as stated above after favorable action had previously been taken by the Senate and House on this important legislation.

### VISIT TO CITY OF MEXICO

G G Coln, member of the AMERICAN PHARMACEUTICAL ASSOCIATION in Mexico writes that if any pharmacists wish to visit Mexico he would like to be advised of the names of the visitors the number and approximate date of their arrival. He will be glad to help in securing hotel reservations. Those wishing to drive by the Mexico Laredo Road may obtain

information at the border from Association Automovilistica Mexicana.

### UNDER SIX FLAGS

"Beautifully impressive is the ceremony first staged June 6, 1936, at the Texas Centennial Central Exposition, where the six flags under which Texas has served were flung to the breeze. Wisely the Centennial management has elected to maintain the flag raising throughout the period of the exposition. With the formal retreat and guard mount ceremonies of the military and naval units the flag raising will become a colorful remembrance for every visitor.

'The six flags play an important and attractive part in the decorative plan of the entire exposition. The huge banners floating in the breeze on the esplanade remind every spectator that here is a State that was once a colony of two great nations part of Mexico, an independent Republic and a commonwealth in two Republics."

### THE ADDICTION TO CODEINE

In a comprehensive article in the *Medical Record* for May 20th, Iwan Ostromislensky places codeine among the group of opiates causing addiction. He concludes his article by saying 'The symptoms of withdrawal in codeine and in morphine addicts are substantially the same.' Terry's report and Himmelsbach's recently published observations show the symptoms do not differ materially, not only in their nature, but also in their intensity. Comment is made because the report differs from that quite generally accepted. In the body of the paper it is stated that 'in moderate doses codeine can be injected daily in the organism of a man over a much longer period of time than can morphine without creating the danger of addiction."

### STOLEN ORDER FORMS FOR NARCOTICS

*Narcotic Circulars* report on lost and stolen order forms. They advise if such forms are presented that they be forwarded to the Treasury Department, office of the Commissioner of Narcotics or advise the Commissioner of the names on the forms and the name and quantity of each item of narcotic drug requested.

Pharmacists desire to be helpful in exposing illegal vendors.

## PERSONAL AND NEWS ITEMS

Professor I M Kolthoff, head of the division of analytical chemistry at the University of Minnesota, is giving a series of lectures at Charles University, Prague. Later, he expects to visit Holland, before his return about the middle of August.

Dr Elmer D Merrill, of Harvard University, in an address before a Washington audience of scientists contended that botany is the oldest of the sciences. He stated that the men of the old school had to know plants in the woods they inhabited, which were good for food and medicine and those that were poisonous. He contended that the early writings along these lines were for the purpose of making their knowledge a matter of record.

The 96th birthday of Wilhelm Bodemann was celebrated on June 4th by the Chicago Veteran Druggists' Association. The Veteran was present on the occasion and he was toasted by Samuel C Henry who is again making his home in Chicago.

Sir Henry Wellcome was in Milwaukee recently on his way back to England after a visit to his old friends Drs Charles and William Mayo at Rochester, Minn. He was tendered a luncheon at the Schroeder Hotel by a group of nine Milwaukee pharmaceutical leaders. Sir Henry was born near Almond Wis. 85 years ago the son of a missionary among the Indians.

H C Christensen, secretary of the National Association of Boards of Pharmacy, was in Dallas recently in the interest of Medicine, Dentistry and Pharmacy at the Centennial. The exhibit at the Dallas show will be less extensive than the one in Chicago. This is on account of the limited space available for the exhibit, however, the exhibit will be of interest to every one connected with pharmacy and the drug trade, as well as laymen. The progress of pharmacy will be shown along with that of medicine and dentistry.

Miss Esther H Barney, who was in charge of the pharmacy exhibit at the Century of Progress Exposition through both summers of its operation and who contributed greatly to its success, will be in charge of the pharmacy exhibit at the Texas Centennial. Miss Barney is a graduate registered pharmacist and a graduate nurse and has had wide experience in these two important fields of public health.

Dr John C Krantz, Jr, will speak before Maryland Pharmaceutical Association (meets

in Baltimore, June 23rd-26th) on "Relation ship of Pharmacology to the Practice of Medicine." Dr Krantz is Professor of Pharmacology in the School of Medicine, University of Maryland.

Samuel L. Hilton is on the Maryland program. He will discuss "Prescription Practice" in relation to some of its difficulties, a subject in which he is an outstanding authority.

William F. Reindollar is now chief of the Bureau of Chemistry of the Maryland State Department of Health. He is referee on Preservatives and associate referee on Ointments of the Association of Official Agricultural Chemists. He has been associated with the State Department of Health for the past several years.

William R. Acheson was honored with the degree of Doctor of Pharmacy by Massachusetts College of Pharmacy.

Edward Spease, dean of Western Reserve University School of Pharmacy, delivered the address to graduates of Philadelphia College of Pharmacy—his subject was "Keeping the Faith."

The pharmaceutical interests were represented at the Interallied Convention held at Sioux Falls, on May 6th by Secretary E F Kelly and Prof E R Series. The latter presented a paper on Drug Standardization. All divisions of medical practice were represented.

Prof J. Lester Hayman, former head of the Department of Pharmacy at the University of West Virginia, has been named Director of the new College recently instituted by the Board of Governors of the University. Among others in the College of Pharmacy are Professors G A Bergy and Fred L. Geiler.

The *New Edition* of June 10th, *Industrial and Engineering Chemistry*, outlines the activities of the University situated in the tallest college building in the world. Reference is made to Duquesne University College of Pharmacy, of which Hugh C. Muldoon is the dean and in connection with the University, refers to the School of Pharmacy of which Dean C. Leonard O'Connell is at the head. Mellon Institute of Industrial Research is a Branch of the University, Dr George D. Beal is Director.

About twenty students and members of the faculty of Philadelphia College of Pharmacy and Science recently visited the AMERICAN INSTITUTE OF PHARMACY.

Dr Celestin Garcia Morales, Havana, who is actively associated with the work of the Spanish revision of U S Pharmacopœia XI, was a visitor at the AMERICAN INSTITUTE OF PHARMACY. He was accompanied by Mrs Morales.

Dr George F Zook, president of the American Council on Education was the speaker at the commencement exercises of the Medical College of Virginia. Nine graduates in pharmacy received degrees. The honorary degree of Doctor of Science was conferred on Dr Lawrason Brown, of Trudeau Sanatorium Saranac Lake New York.

Remington Medalist elect, Professor E N Gathercoal and Mrs Gathercoal were visitors at the AMERICAN INSTITUTE OF PHARMACY. The award will be a feature of Pharmacy Week.

Mrs Nellie Perry Watts, wife of a West Chester, Pa, pharmacist, won eleven prizes at Philadelphia College of Pharmacy and Science. The Procter prize, the Frank Gibbs Ryan prize the William B Webb memorial prize, the Frederick William Hausman Memorial, the Lamba Kappa Sigma Sorority the Women's Auxiliary of the Dauphin County Pharmaceutical Association, Remington Memorial the Mahlon N Kline and the prize of the Alumni Association.

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#### MASSACHUSETTS COLLEGE OF PHARMACY A PH A PRIZES

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#### THE SECTIONS

**Scientific Section**—*Chairman*, H M Burlage, Chapel Hill N C, *First Vice Chairman* G L Jenkins, Baltimore, Md, *Second Vice Chairman*, Justus C Ward, Denver Colo, *Secretary*, F E Bibbins 5840 Washington Blvd, Indianapolis, Ind, *Delegate to House of Delegates*, E V Lynn, Boston, Mass.

**Section on Education and Legislation**—*Chairman*, C Leonard O Connell, Pittsburgh Pa, *Vice-Chairman* George C Schicks, New ark N J, *Secretary*, George A Moulton Peterboro N H, *Delegate to the House of Delegates* L W Rising Seattle, Washington.

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STATE ASSOCIATION MEETINGS—  
JULY, AUGUST AND SEPTEMBER

Ohio—*President*, Garrett Emch, Toledo,  
*Secretary*, Victor Keys, Columbus Cedar Point, July, third week

Oregon—*President*, John F Allen, Corvallis,  
*Secretary*, Lawrence Stovall, Maupin Gearhart, July 6th 8th

Tennessee—*President*, L S Elgin, Knoxville, *Secretary*, Tom C Sharp, Nashville Nashville, July 20th–23rd

New Hampshire—*President*, George A Moulton, Peterboro, *Secretary*, Rodney A Griffin, Franklin The meeting will be held in September

AMERICAN PHARMACEUTICAL  
MANUFACTURERS' ASSOCIATION

The American Pharmaceutical Manufacturers' Association closed its annual sessions at Hot

Springs, Va., on June 11th The officers of the Association were reelected *President*, George R Flint, Decatur, Ill., *First Vice President*, Carrol Dunham Smith, Orange, N J., *Second Vice-President*, J C Fausnaught, Worcester Mass., *Secretary*, C W Warner, Newark N J., *Treasurer*, Frank A Mallett, Des Moines, Iowa

The Association went on record endorsing Senate Bill 5

## PLANT SCIENCE SEMINAR

This year's Seminar will be held at a camp in the heart of a 6000 acre State Park and Game Preserve on the headwaters of the Fourche Moline Creek It is 9 miles north of Wilburton, Oklahoma, on State Highway No 2 in the San Bois Mountains

The camp is in the pine oak association of the Kiamichi Mountains The more conspicuous trees are *Pinus echinata*, *Quercus marilandica* and *Quercus stellata* Other plants of interest are witch-hazel, flowering dogwood May-apple, an abundance of redbud, sassafras, river birch and wahoo The vegetation resembles that found in southern Arkansas and northern Louisiana

## THE CAMP

The camp has five buildings of native stone that are suitable for sleeping quarters, each one accommodating comfortably, eight people In addition there are pyramidal tents which may be set up for family groups It has a gravity flow of water secured from a spring, shower baths, etc

Excellent camp meals and camp facilities will be provided at the rate of not more than \$2 25 per day for adults, and \$1 00 for children under twelve

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"To any member of the Plant Science Seminar who thinks of motoring to the meeting, the Conoco Travel Bureau, Denver Colorado, offers free travel service They will send you, on request, a set of state maps individually marked for you, to show you the best and most direct routes from your home to the Seminar The types of roads and road conditions will be indicated, and lists of hotels and cottage camps included

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Griffin, Franklin *The meeting will be held in*  
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The camp is in the pine oak association of  
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ous trees are *Pinus echinata* *Quercus marilan-*  
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terest are witch hazel, flowering dogwood May-  
apple, an abundance of redbud, sassafras, river  
birch and wahoo The vegetation resembles  
that found in southern Arkansas and northern  
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## THE CAMP

The camp has five buildings of native stone  
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inches in size and are interleaved with descriptive literature, camp lists, etc., and are neatly bound. The Bureau outlines your route over each map. They are free for the asking, address Conoco Travel Bureau, Denver, Colorado and ask for a routing to the Seminar.

#### TENTATIVE PROGRAM

Monday August 17th Arrival at Camp Registration and get acquainted

Tuesday August 18th, 7 30 A M, Breakfast 8 30-11 30 short hike and botanizing trip 12 00 Noon Lunch 2 30-4 30 Program in Main Hall 6 15 P M, Dinner

Wednesday August 19th 7 30 A M, Breakfast 8 30-4 00 P M, auto trip under the direction of the State Forester (Lunch to be furnished by the Camp) 6 15 P M, Dinner

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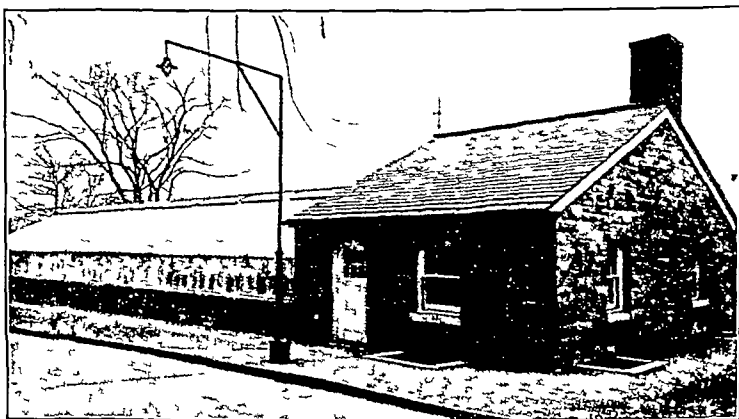
Friday, August 21st, 6 30 A M, Breakfast 7 30 A M, Breakfast and auto caravan through some Oklahoma Oil Fields Lunch at Platt National Park On to Dallas

#### COMMENTS

The following papers have been promised "Ecuadorian Sarsaparilla," by Heber W Youngken F J Bacon will have two papers titles to be announced L K Darbaker will bring motion picture films of former Seminars

The completed program will be announced in next issue

The officers are *President* F J Bacon Western Reserve University, *Vice President* A W Matthews, University of Alberta, *Secretary* E H Wirth University of Illinois, 715 S Wood St, Chicago, Ill, *Local Secretary*, Loyd E Harris University of Oklahoma *Members of the Executive Council* Frank H Eby, Temple University William B Day, University of Illinois



Green House at Fordham University

#### PHARMACEUTICAL PLANT GARDENS

H J Holthoefer an enthusiastic gardener and Dr Frank B Kirby have taken up the possibility of a medicinal plant garden somewhere in Lincoln Park Chicago

Dallas has a park named in memory of Julien Reverchon late botanist at Baylor University College of Pharmacy (The latter has been discontinued)

Herewith is shown the Green House in the botanical garden of Fordham University Department of Science completed under the direction of Prof William J Bonsteel The building is 28 by 70 feet

#### AMERICAN DRUGGISTS' FIRE INSURANCE COMPANY

The annual meeting of the American Druggists' Fire Insurance Company (30th anniversary) was held during the week of June 1st Representatives of various State and National pharmaceutical organizations were in attendance as guests and representatives of the Company celebrated an annual home coming

Elaborate programs were provided and the visitors enjoyed a garden party at the home of Mr and Mrs F H Freericks

## CONNECTICUT PHARMACISTS

Connecticut pharmacists will hold their sixtieth Anniversary meeting, June 24th and 25th, at New London. Secretary Alice-Esther Garvin states that it will be a unique, inspirational, valuable and social meeting. There will be an exhibit and the program has been prepared by John H. James, President. Joseph A. Murphy will preside, John J. Dugan, the first graduate of Connecticut College of Pharmacy, will be in charge of the professional phase. Among the speakers will be Dean C. Leonard O'Connell, of Pittsburgh College of Pharmacy, Dr. J. Leon Lascoff, Secretary John Dargavel, N. A. R. D.

## TEMPLE UNIVERSITY

Louis Weiner was awarded the John R. Minehart Gold Medal, the Henry Fisher Gold Medal (Materna Medica), the H. Evert Gold Medal (Pharmacy), James C. Attix Prize, Alumni Medal (Pharmacy Laboratory), the Robert L. Swain Prize (Pharmaceutical Law), Herman E. Lecks Prize (Chemistry).

Pharmacy Alumni Medal (Chemistry Laboratory), was awarded to Raphael Abrams, Microscopy Armand Bernabei, Character and Scholarship, Anthony Borgia, Gold Medal for second highest average, Raphael Abrams. A. I. Kremens received Gold Medal in recognition of sacrifices and perseverance, Circolo Italiano Prize, highest scholastic average, Yolando Monticelli. John Howard Graham Physics Prize was awarded to T. A. Walb.

## MARYLAND UNIVERSITY

Charles Henry Davis, 71-year-old New York philanthropist, announced plans for the development in his address to the graduating class. Ultimately, he said, 22 new buildings may be built on the campus with funds and equipment donated by "several interested persons."

Governor Harry W. Nice also spoke at the annual graduation exercises.

## THE SCHOOL OF PHARMACY

Melvin F. W. Dunker received the degree of Master of Science from the Graduate School of the University of Maryland, the major part of the work having been done in the School of Pharmacy.

Casimer T. Ichniowski and Harry Rosen received the degree of "Doctor of Philosophy" from the Graduate School of the University of Maryland, the major part of the work having been done in the School of Pharmacy. Dr.

Ichniowski and Dr. Rosen specialized in Pharmacology.

Honors were awarded: Gold Medal for General Excellence, Bertram Kamber, The William Simon Memorial Prize for Proficiency in Practical Chemistry, Carroll P. Foster, The Simon Solomon Prize (\$50.00) for most satisfactory work in the third and fourth years of the course, Frank A. Bellman, The Lawrence S. Williams Practical Pharmacy Prize (\$25.00), Paul H. Thompson, The Conrad L. Wich Botany & Pharmacognosy Prize (\$15.00), Benjamin Levin.

Certificates of Honor were awarded to Nathan Levin, Alexander Ogurick, Frank A. Bellman. Honorable mention to Albert Heyman, Bernard L. Zenitz, Leonard Rapoport.

## THE ALUMNI

The Alumni of the School of Pharmacy held their annual banquet June 3rd at the Lord Baltimore Hotel. Rabbi Dr. Edward L. Israel delivered the annual address. Other speakers at the banquet were H. C. Byrd, president of the university, Dr. Andrew G. DuMez, dean of the School of Pharmacy, Dr. Hyman Davidov, president of the Alumni Association, William M. Fouch, honorary president of the Alumni Association, Dr. J. Milton Patterson, Cumberland, member of the board of regents of the University. L. B. Wright, of the traveling affiliates of the Maryland Pharmaceutical Association, presided as toastmaster.

PHILADELPHIA COLLEGE OF  
PHARMACY AND SCIENCE

Philadelphia College of Pharmacy and Science honored Irwin Atwood Becker, Illinois. Adley Bonsteel Nichols, Pennsylvania, Edward Spease, Ohio, with the degree of Master of Pharmacy Degrees, conferred in Course, were awarded to John Hampton Hoch, South Carolina, and Paul Alvin Mattes, Pennsylvania—"Doctor of Science in Biology." "Doctor of Science in Bacteriology" was awarded to Francis Cornelius Lawler, California, and John Neumann McDonnell, Pennsylvania. "Master of Science in Chemistry" was earned by Arnold Koff, of New Jersey, William Frederick, Jr., Charles Clifton Pines, Louis Alexander Reber, Philip Rubenstein, Frederick Walter Schreiber and Reber Steiner, of Pennsylvania. The degree of "Master of Science in Bacteriology" was awarded to George Mohlvere Eisenberg of Pennsylvania, and "Master of Science in Biology"—Berlton Melkon and Martin Sylvester Ulan, of Pennsylvania.



## PARAGRAPHS FROM A COMMENCEMENT ADDRESS \*

BY HUGH CRAIG

Other parts of the address could have been selected, all have an impressive meaning

You are now graduates in pharmacy

The graduated glass as you know, has space above the top line of its calibrations Your graduation also leaves a similar, superior space That is where will be engraved the marks you make yourself—and there is no maximum limit other than that which you set

Your graduation, like that of the measuring glass equips you for a particular service It assures you nothing beyond the recorded ability It makes no opportunity for you, but it gives you a certain ability to recognize and realize opportunities It enables you to an extent to make your own opportunities—and there is no overproduction of opportunities in the drug field in truth the pharmacal side of the retail drug business was never more promising for those who have the ability and the will to develop it

When I was in the retail drug business we leaned more heavily on the pharmacal side of the business than is the general practice at the present time To day the druggist's sorriest woe is that caused by unfair competition, of which price-cutting is the major symptom aggravated by discrimination in the prices at which over the counter goods are sold to competitors of various classes

This too, is a debatable economic problem Like all other economic problems it arises from a distortion of social relations For this reason it cannot be solved by legislation alone In fact the efficacy of any legislative remedy for this economic evil, beyond a psychological influence, is practically negligible

The real remedy lies in the development and acceptance of fair play in the relationships of man to man It requires primarily knowledge and appropriate use of the halogens of the social system

You are familiar with the chemical halogens The social halogens have the same symbols but different names—F designates faith, Cl cleanliness, Br brains, I integrity

The social halogens also have a periodic grouping different from that of the chemical halogens

Like the chemical halogens, those of the social system are multivalent Again similarly they form very important compounds with H—which is humanity Their most useful combinations are those which contain the C of courage Those who have the courage to apply their faith in all their actions, who will be clean in all that they do, who will not prostitute their intelligence, who stand firm in integrity—these are the leaders of men

When there has been developed a reasonably large supply of the C compound of the social halogens which will contain all the latter all economic problems will be solved, for that compound is a most efficacious social solvent

Human relations are the basis of all economic conditions

The greatest service performed by any one letter of the alphabet is that of the letter 's' in converting the brain, an anatomical structure, into brains an instrument of intelligence But no letter or letters not even Ph G or Ph D, have yet contrived the intelligent use of that instrument

How beneficial it would be if all members of the drug trade made full use of their brains to analyze their problems and especially to analyze the solutions proffered therefor, and, combining the Br with the C of courage, refused longer to be misled, and proceeded to carry through to the intelligently determined end!

Integrity is the greatest of the social halogens Its antiseptic power, prophylactically and remedially matches in efficacy that of its chemical analog—iodine—and it is absolutely harmless to all but pathogenic organisms Unfortunately integrity is the rarest element of the social system This is regrettable, but it is not the end The world's supply is constantly getting larger

You are engaging to perform a useful service Your success will be the measure of your ability to look to causes, beyond the symptomatic effects, in the problems that you meet Start with yourselves when you see a need for improvement in anything in which you have a part

You have been admitted through the outer gate of the oldest honorable profession You need not respect its age, but please always respect its honor You have yet to pass the inner portal where the board of pharmacy stands guard

\* The College of Pharmacy of the City of New York, Columbia University

Death of Dr J T Mason, president of American Medical Association, Seattle on June 20th, is reported June 20th

## LEGAL AND LEGISLATIVE

## THE ALBERTA CODE OF FAIR COMPETITION

Section six of article six reads as follows

"No retailer shall give to any customer any premium, free goods below his regular price in any type of combination offer, secret discounts, rebates, free samples of commercial size or special services, for which the customer would be in the ordinary course of business charged for such by the retailer, nor shall he issue any false or inaccurate invoice or quotation, imperfectly recording or concealing the true facts of any transaction "

## ALABAMA BARBITURIC ACID LAW

The State Legislature recently passed a law here requiring that trional, sulphonal, tetronal and other barbituric acid products be sold only by prescription Dr J N Baker state health officer, has requested the cooperation of druggists and doctors with state officials in the enforcement of the new ruling The act provides for a fine of \$10 00 to \$500 00 for violations

## U S DRUG BUREAU AND THE NEW STANDARDS

P B Dunbar, Assistant Chief of the Administration, in a letter to the Drug, Chemical and Allied Trade Section of the New York Board of Trade said Where articles in the 11th revision are 'materially different' in composition or strength from those in the 10th revision, and particularly where a product, because of its potency is regarded by the medical profession as a highly important drug, such as tincture of digitalis 'there is not only a legal but a moral obligation upon manufacturers and distributors to market their products strictly in accordance with the requirements of the act "

'The Federal Food and Drugs Act specifically provides that articles sold under official names must comply with the standards provided by the United States Pharmacopœia or National Formulary official at the time In order to enable manufacturers and distributors of drugs to familiarize themselves with the changes and to permit them time to adjust their preparations and labelings to conform with the new standards the Revision Committees set the time when these works would be come official approximately six months after the date of their publication

'There is of course, a realization on our part of the practical difficulty of having all official articles in the channels of commerce comply with the requirements of the U S P X on May 31st and those of U S P XI on June 1st The Bureau of Chemistry at the time previous revisions became effective recognized this difficulty, and it is not the purpose of the Food and Drugs Administration to adopt a more stringent attitude during the present transition period

"Fortunately, there are comparatively few articles in which the standards in the two editions are materially different In such cases there is no public health or economic reason for insisting on an exacting label differentiation between the two types of products "

## A LEGAL OBLIGATION

"Where articles recognized in the eleventh revision of the Pharmacopœia are materially different in composition or strength from those described in the tenth revision, and particularly where the product, because of its potency is regarded by the medical profession as a highly important drug such as tincture of digitalis, there is not only a legal but a moral obligation upon manufacturers and distributors to market their products strictly in accordance with the requirements of the act

"There is, of course, no objection to the marketing during the period between now and June 1, 1936 of preparations made according to the forthcoming standard in order that these products may be available for prescription and other uses after June 1st In the interest of safety, however, it is highly desirable that the labelings of these products prominently warn the purchaser that they conform to the new standard and differ from the old "

## TEXAS CHAIN STORES TAX ATTACKED

The issue as to whether a single store or chain of stores has the advantage in merchandising and advertising was raised in testimony Monday in the opening of the attack by 827 Texas chain stores on the validity of the State's graduated tax on chains before Judge Royall R. Watkins of Ninety Fifth District Court

The chain store attorneys sought to show through examination of two witnesses that the single store has the advantage in business and added to this the claim through testimony that

syndicate methods of buying and advertising by single stores gives them an advantage

The State countered with cross examination designed to show that ownership of sources of revenue in many localities is advantageous in operation over single-locality merchandising on the ground that prospering stores would

help bear the burden of stores which were less prosperous

The suit is brought by several chains which claim their annual tax under the law would total \$716 817 50 Temporary injunctions issued by Judge Watkins in January prevent the enforcement of the tax law

## BOOK NOTICES AND REVIEWS

A Avigdor, export manager of Laboratorio Quimico Central S A, has published a new directory covering all physicians and pharmacists in Mexico It contains very interesting information on hospitals, scientific societies, National University of Mexico and its various departments, charity organizations, etc—the name is Directorio Medico Mexicano and it is a source of valuable information Price \$2 50

*The Medical Formulary and Prescription Manual* A Treatise on prescriptions and prescription writing by MORRIS DAUER Ph G Chief Pharmacist at Kings County Hospital Borough of Brooklyn City of New York Approved and adopted by the Department of Hospitals City of New York, September 13 1934 First edition

In this compact volume the author has presented in practical form prescriptions prepared and carefully checked through many years and designed for use as a modern Medical Formulary and Prescription Manual The book is divided into fourteen departments including all the specialties of medicine together with their many subdivisions Thus we have external and internal preparations for use by dermatologists prescriptions used by cardiologists gynecologists and obstetricians ophthalmologists otologists pediatricians surgeons urologists laryngologists as well as prescriptions used in diabetic medication and various other prescriptions for external and internal use including prescriptions for glandular products

The author also discusses such interesting topics as aromatics and coloring in prescriptions giving the busy practitioner a quick and reliable review of this phase of the prescribing art

Conversion tables of weights and measures, percentage solution tables and a well prepared index complete the volume

In addition to supplying considerable information for the use of hospital staffs this book will also be found useful in promoting prescrip-

tion compounding and prescription writing where joint committees of physicians and pharmacists are engaged in the various counties and states in promoting this very important activity—R P FISCHER

It is necessary to defer other Book Notices and Book Reviews to succeeding issues of the JOURNAL

## WISCONSIN BOARD OF PHARMACY

Appointment of Edward Kremers to the state board of pharmacy has been announced by Governor Philip F LaFollette, also of S H Dretzka, former president of the Wisconsin Pharmaceutical Association, H G Ruenzel Milwaukee, was named secretary of the Board

## WEST VIRGINIA ASSOCIATION

West Virginia Association will hold its annual session at White Sulphur Springs, June 29th and 30th Among the speakers listed are E F Kelly, Jerry McQuade John W Dargavel, Congressman Wright Patman

The *Bulletin* for June carries much information and evidences the attention given to matters concerning druggists Immediate attention was given by its editor to the article in *Colliers* of May 23rd

## NEW MEXICO ASSOCIATION

The most successful meeting in the history of the New Mexico Association was held in Albuquerque May 20th President Welch delivered a most forceful address, giving a résumé on the activities of the Association during the past year and laying special stress on what must be done in the future for the advancement of pharmacy

Secretary Charles J Clayton, of the Colorado Pharmaceutical Association, presented a comprehensive paper on national legislation

The following are the new officers of the Association *President*, H I Braden Carlsbad, *First Vice President*, S J Mollands, Taos *Second Vice President*, Covey Baker, Las Cruces, *Secretary-Treasurer* H E Henry (re elected) Albuquerque

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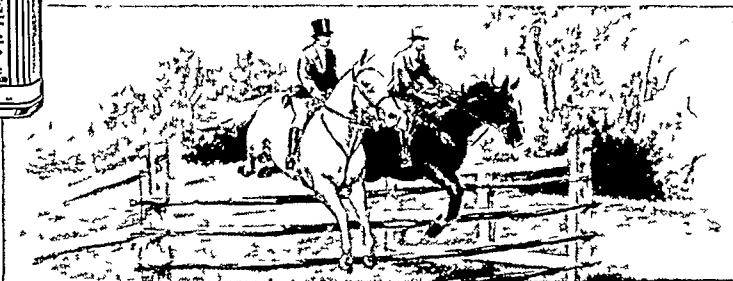
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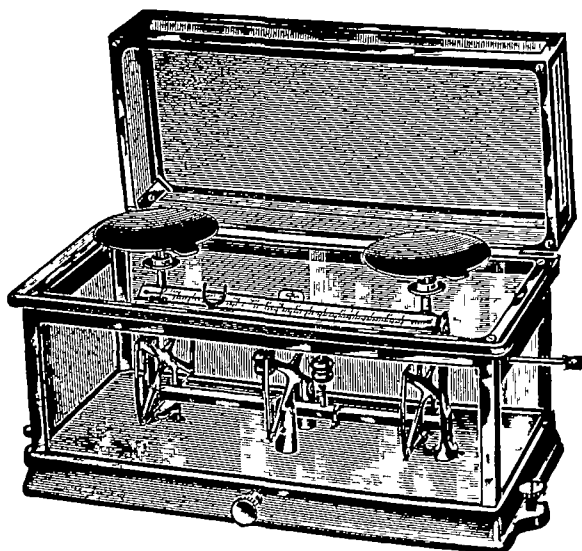
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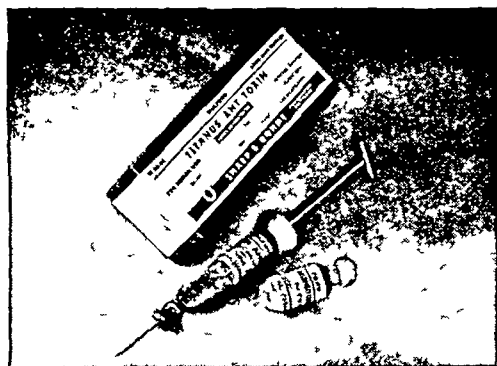
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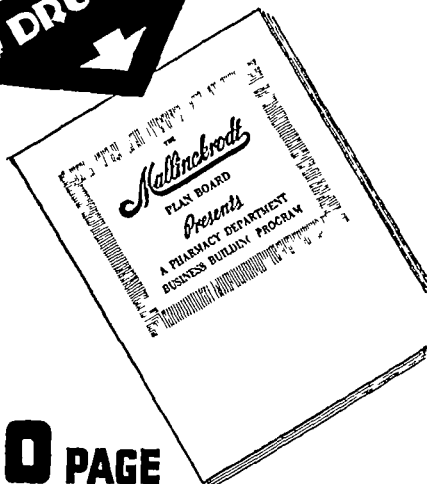
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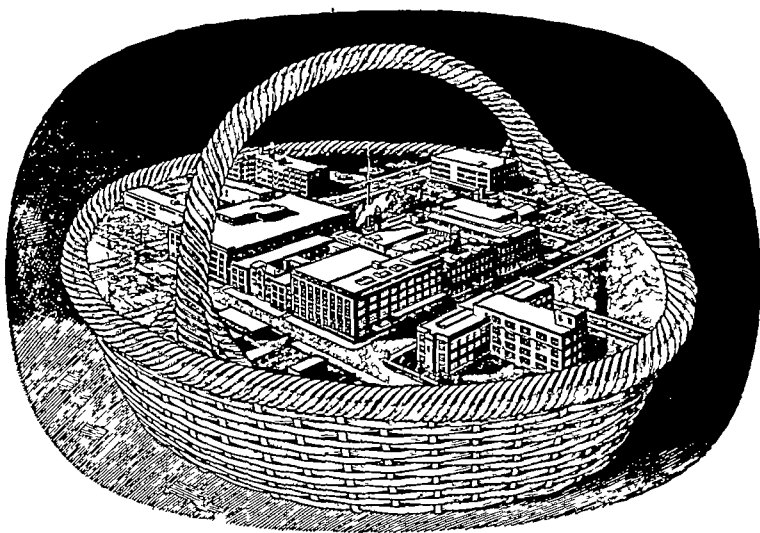
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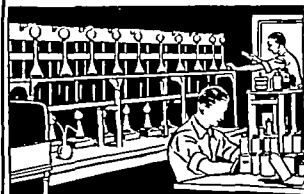
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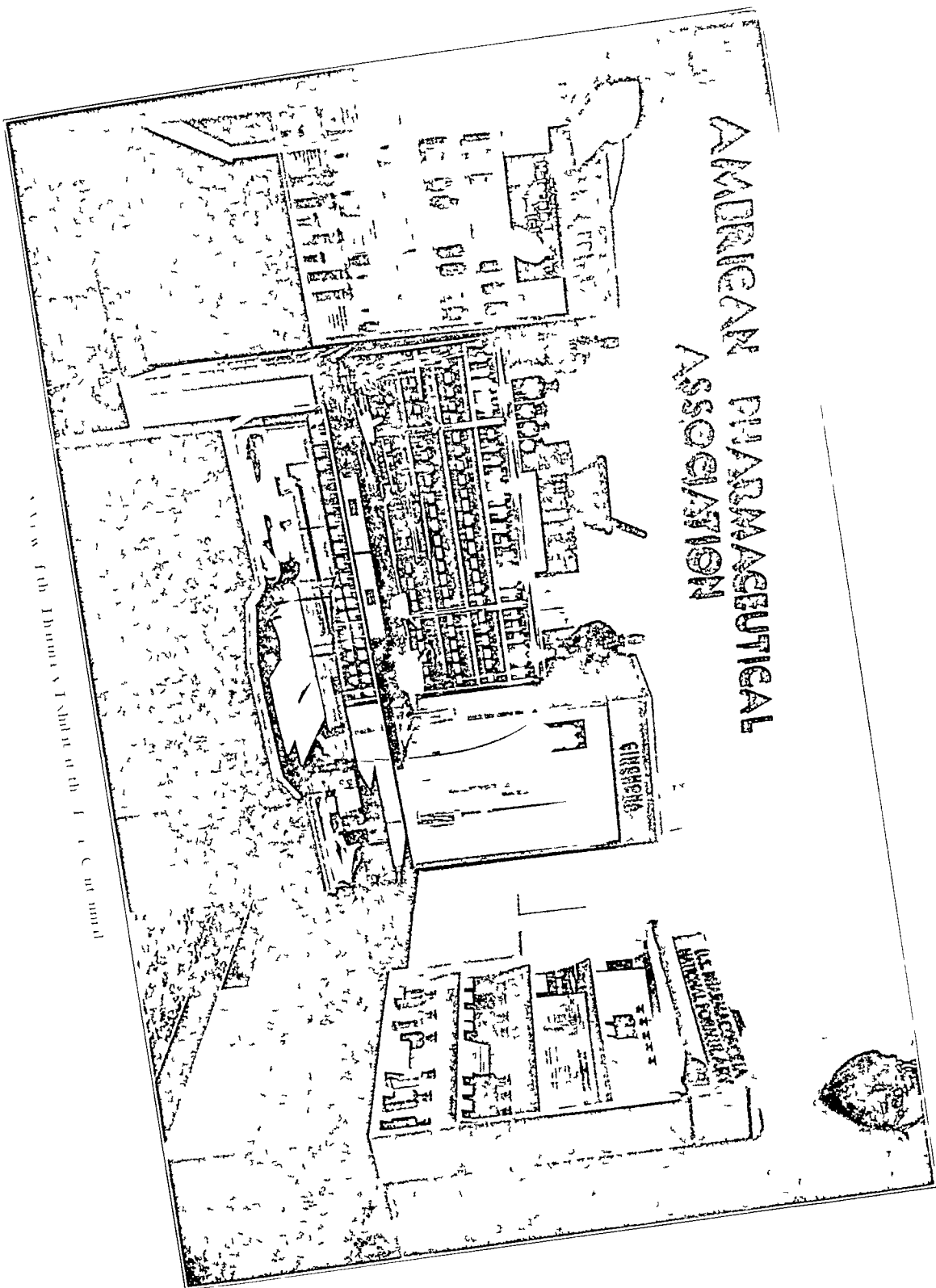
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WESLEY McCLUNG CHILDS

# JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXV

JULY, 1936

No 7

## THE PRESIDENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

Wesley McClung Childs, "Mac," president of the National Association of Boards of Pharmacy, was born at Columbus, Kans, November 13, 1895. He received his early education in the grade and high school of Kansas City, Kans. Thereafter, he graduated from the Pharmacy School of the University of Kansas. He was a student at the University of Montpellier, Herault, France, and earned the degree of Ph C.

Mr Childs enlisted on the day the United States entered the World War (1917) and went overseas as sergeant of Ambulance Company No 139, 35th Division, he was later transferred and assigned as chemist in charge of Water Analysis for combat troops. While with the American Expeditionary Forces, in France, he participated in the engagements at Thann, St Mihiel, Argonne Forest, Gerardmer, Dieu-Sommeieu. After two years of service Mr Childs received honorable discharge at Camp Funston, May 1, 1919. Every male member of the family served overseas in the trenches, the father, W R Childs, was badly gassed and shell-shocked and a brother, Joseph, was killed in service.

The subject of this brief sketch has owned and operated The Hospital Pharmacy, El Dorado, Kans for 17 years, and the Childs Manufacturing Company for the past 8 years, the latter establishment manufactures the Childs Prescription File and other pharmaceutical equipment.

Mr Childs is a former president of Kansas Board of Pharmacy and is its secretary, he has held important offices in the National Association, as former vice-president, and is now its president. He was president of the Kansas Pharmaceutical Association in 1933, has held the office of secretary, is a member of the executive committee, served as chairman of the legislative committee of both state and national organizations and has been one of the leading and influential personal forces in Kansas pharmacy for a number of years.

President Childs is a member of the AMERICAN PHARMACEUTICAL ASSOCIATION, of the National Association of Retail Druggists, of the Kiwanis Club, of the American Legion, Veterans of Foreign Wars, and is a member of the Masonic bodies.



# EDITORIAL

E G EBERLE EDITOR

2215 Constitution Ave WASHINGTON, D C

## THE PROGRESS OF PHARMACY

WE HAVE come a long way since 1852. A mark of the progress of time is noted by the number of state associations which have concluded fifty years of organized effort with golden anniversary celebrations. We have every right to be proud of the record of the AMERICAN PHARMACEUTICAL ASSOCIATION in promoting the interests of the profession during the eighty-four years of its existence.

Profound changes in our economic and social structure have occurred during this period, but we are more aware of the progress and advances in the art and science of pharmaceutical practice since its beginning. We can be proud of the fact that all of the credit for the development of our science belongs to the profession itself. The AMERICAN PHARMACEUTICAL ASSOCIATION deserves much credit for its influence and direction. What seems most remarkable about it all is the fact that, eighty-four years ago, the men who recognized and asserted the needs of Pharmacy were able to act as wisely as they did and lay a foundation of which a large part still stands.

Public health service, service to the physician and the public, has been and will always be the first order of the pharmacist. Interprofessional relations between the physician, dentist and pharmacist have been evident during the years. The same reasons which early prompted that small group of professionally minded pharmacists to band themselves together should prompt us to meet the more pronounced needs of to-day when the pace of progress is more rapid. The movement to create a greater spirit of cooperation between physicians, dentists and pharmacists is taking a definite form. Pharmacists should welcome the opportunity to cooperate to the fullest extent with others interested in public health. It is reassuring to see evidenced a greater interest in pharmacy by pharmacists and a greater recognition of both by the allied public health groups and the public.

Pharmacy is well equipped to meet the demands upon it and will either succeed in doing so or fail, depending upon the influence and direction applied. The AMERICAN PHARMACEUTICAL ASSOCIATION must continue to assume the responsibility of leadership.

This responsibility cannot and will not be ignored by the ASSOCIATION nor its officers. Through cooperation, understanding and the individual effort of our membership Pharmacy will assume its proper rôle.—P H COSTELLO

## THE FEDERAL FOOD AND DRUGS ACT

THERE was an evident desire or willingness on the part of the drug trade activities to have new food and drug legislation enacted. There were differences among organizations affected, but these differences were not the immediate cause for the failure of the enactment. Either revision of the present Act or new legislation as submitted, *et cetera*, with certain changes, seemed necessary, but the lateness of the session and differences of opinion relative to phases of control in administration bodies and among the members of Congress, prevented acceptance of the conference action. The House insisted on its provision giving the Federal Trade Commission jurisdiction over advertising of foods, drugs and cosmetics, Senator Cope land "would not deprive the Food and Drug Administration of essential control over matters pertaining to public health."



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The result points out that in measures of this kind there is a possibility to bring about an understanding which will serve the public better than a misunderstanding, if there is a willingness to reach conclusions that are uninfluenced by the sources of motives, but it is difficult to accomplish agreement in a last minute consideration

It may be questioned whether a new law is necessary or whether shaping of present legislation is better, but legislation of this kind is for the protection of public health, it is a means that requires careful consideration, fairness in framing and in defining effective standards

There were many changes in the bill, not much to criticize, perhaps the outstanding criticism to offer was that action was too long delayed and then hurried action expected on a very important measure There may not have been jealousies, but there were contentions which prevented revision or enactment of the food and drugs law

When the subject comes up again there should be early rational discussion without unwarranted disparagement, with a purpose to bring legislation into form which will have public health service as a first and paramount aim

#### COMMISSIONED RANK FOR PHARMACISTS

PHARMACISTS have had professional rank for several years under the Civil Service and commissions in the Public Health Service During the 2nd session of the 74th Congress the National Defense Act relating to the Medical Administrative Corps was amended to provide commissions for pharmacists who are graduates of recognized schools or colleges of pharmacy, requiring four years of instruction for graduation, under such regulations as the Secretary of War shall prescribe The President has signed the Act, this provides the basis, in the future, for the organization of a Pharmacy Corps when the number of commissioned pharmacists is increased, its adoption also makes possible the commissioning of pharmacists in the Reserve Corps and in the National Guard, as soon as arrangements can be worked out, which means that a properly organized pharmaceutical service can be established in time of War or of other necessity

The AMERICAN PHARMACEUTICAL ASSOCIATION and affiliated organizations have contributed to the success of the enactment, and much credit is due to Surgeon General Charles R Reynolds, who soon after his appointment gave attention to the question of improving the pharmaceutical service in the Medical Department of the Army and to giving pharmacists commissioned rank

The bill (S 4390) presented by Senator Morris Sheppard was amended in accordance with the views of the War Department and from that time forward the measure received the undivided support of the members of the Committee on Military Affairs of the Senate, of Representative John J McSwain, Chairman of the House Committee on Military Affairs, of the members of the Committee, in fact, the bill did not receive an unfavorable comment or a negative vote in its passage through both Houses of Congress The very evident purpose is to have pharmacy render an essential service, and the legislation contributes advancement to the profession

The Medical Administrative Corps has an authorized strength of 72 officers, the bill limits future commissions in this Corps to pharmacists, and the 16 commissions at present authorized are estimated to cover the vacancies expected within the next year

References to the measure and to those who were helpful in the promotion have been made in prior issues of the JOURNAL. The Acting Secretary of War, Harry H. Woodring, referring to enlisted men of the Medical Department with meager qualifications for such commissions, stated they have not materially added to the efficiency of the Medical Service because of their lack of professional and technical experience and attainments, and the letter from the War Department, bearing on the subject, closes with the statement that this legislation "will give these specialists the recognition in rank to which they are entitled."

Pharmacists will improve their opportunities and contribute to the professional service of pharmacy. The effort represents one of the promotions of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Parts of *Bulletin No. 15, A. P. H. A.*, of June 22nd, have been embodied in this comment.

### THE PHARMACY EXHIBIT AT THE TEXAS CENTENNIAL

ON PAGE 573 of this issue of the JOURNAL a view of the pharmacy exhibit at the Texas Centennial is shown. Chairman H. C. Christensen contributed largely to the success of the pharmacy exhibit at the Chicago World's Fair and Dr. Eben J. Carey, Chief of the Medical Section, Hall of Science, has donated to the AMERICAN PHARMACEUTICAL ASSOCIATION an illustrated volume, depicting the medical sciences. Plates 37-39 show the pharmacy exhibits and pages 70-74 describe them and give the history therewith. Cooperating with Mr. Christensen at Chicago were Miss Esther Barney and Mr. Thaddeus Niemic, who were in attendance and contributed largely to the interest of the visitors at this exhibit. These co-workers designed and installed the Texas Exhibit and they were present at the opening in Dallas on June 6th.

The AMERICAN PHARMACEUTICAL ASSOCIATION sponsored the latter, upon invitation and request of the U. S. Public Health Service. The exhibit is located in the U. S. Government Building, the space available did not permit such an extensive display as at Chicago, but it has been arranged by those named to bring pharmacy and its public health service to the attention of the visitors. Dr. R. C. Williams, Assistant Surgeon General, U. S. Public Health Service, is in charge of the Exhibit, portraying scientifically the "Story of Life," and the Pharmacy Exhibit is one of this group. The story begins with the geological investigation in Utah and other sections by the Smithsonian Institution and is carried through the evolution of animal life and finally to man, including his diseases and the methods he has developed for preventing and treating them. The exhibits of the public health professions are arranged to show their relation to each other and the laity. Pharmaceutical relics and equipment will also illustrate the development of pharmacy in Texas.

*Bulletin No. 16* has been drawn upon for the basis of this comment. The AMERICAN PHARMACEUTICAL ASSOCIATION will convene August 24th-29th, in Dallas, and members will have the opportunity to visit the Texas Centennial Exposition. Each annual convention of the ASSOCIATION has its special attractions and affords attending members an opportunity to become acquainted with the section of the country in which the meeting is held and to study the problems of its druggists and pharmacists.

## SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, Glenn L Jenkins, John C Krantz, Jr.,  
Heber W Youngken, L W Rowe, L W Rising, C O Lee, E V Lynn, W G Crockett,  
Frederick V Lofgren

### THE POTENCY OF ELEVEN CRYSTALLINE CARDIAC PRINCIPLES FROM PLANTS \*<sup>1</sup>

BY K K CHEN, A LING CHEN AND ROBERT C ANDERSON

In connection with our work on bufagins and bufotoxins isolated from the paratoid secretions of different species of toads (1), comparative studies were made with several crystalline substances of plant origin reported to have a digitalis-like action. In view of the fact that they have never been assayed under the same conditions, the presentation of our data may prove helpful to other workers who are interested in their relative activity. Furthermore, the differences in potency noted in this work may throw some light upon the significance of certain groups in their chemical structure and stereoisomerism, since progress in this field has been rapidly made (2), (3). The list includes convallatoxin,  $\beta$ -antiarin, ouabain, cymarinn, scillaren A, uzarin, digoxin, digitoxin, gitoxin, erythrophlein sulphate and thevetin. With the exception of erythrophlein, which is an alkaloid of *Erythrophleum guineense*, the other compounds are glucosides. The authors are indebted to Dr W A Jacobs, the Rockefeller Institute for Medical Research, New York City, for a generous supply of cymarinn, to Professor R L Stehle, McGill University, Montreal, for that of scillaren A, and to Dr R Tschesche, University of Gottingen, Germany, for that of uzarin and  $\beta$ -antiarin. Thevetin was isolated by ourselves from *Thevetia neriifolia* (4), while ouabain, erythrophlein sulphate and digitoxin were purchased from Merck and Company, Rahway, New Jersey, convallatoxin from Hoffmann-La Roche, Inc., Nutley, New Jersey, and digoxin and gitoxin from Burroughs Wellcome and Company, Tuckahoe, New York. The last two principles were first isolated by Smith from *Digitalis lanata* (5).

Of the eleven compounds, gitoxin is so insoluble in alcohol or water that its action and potency could not be accurately determined. The remaining substances are soluble in dilute alcohol. Ouabain and erythrophlein sulphate are the only members that are completely soluble in water. In our experiments, a stock solution of each to contain 0.1 per cent of the drug was prepared. Cymarinn, scillaren A, digoxin and digitoxin required 47.5 per cent ethyl alcohol to effect solution (one part 95 per cent alcohol and one part saline), and convallatoxin and  $\beta$ -antiarin 28.5 per cent (three parts 95 per cent alcohol and seven parts water). With thevetin, 19 per cent alcohol was employed. Both ouabain and erythrophlein were dissolved in saline. Uzarin was made up into 1 or 2 per cent solution in 47.5 per cent alcohol. Appropriate dilutions were then made from the stock solution for the tests desired.

It may be pointed out that erythrophlein is the only alkaloid known to have a digitalis-like action (6), (7). The specimen (in the form of a sulphate) we obtained

\* From the Lilly Research Laboratories, Indianapolis, Indiana

<sup>1</sup> Scientific Section, A PH A, Portland meeting, 1935

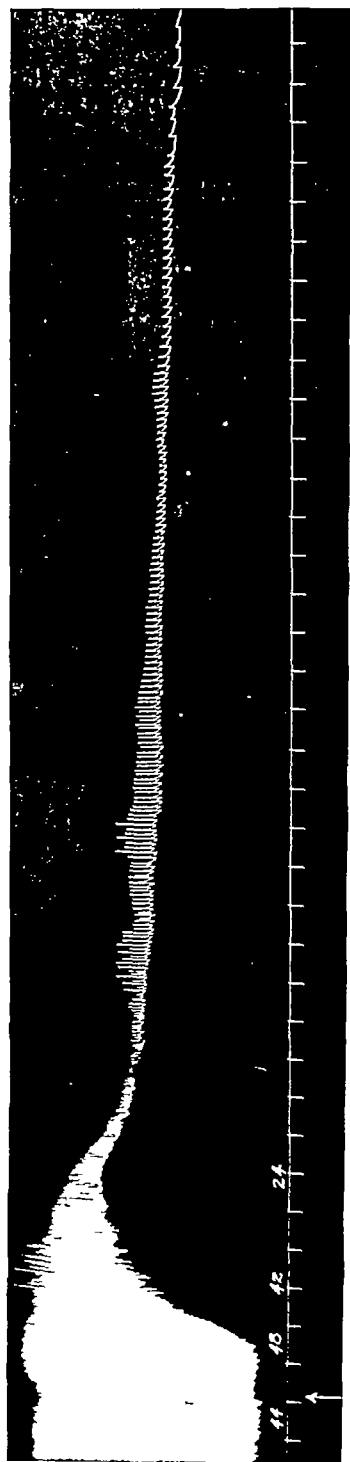


Fig 1—Action of Erythrophlein on Frog's Heart Frog No 567, female, weighing 61 Gm, was decerebrated and pithed. At arrow, the heart was perfused with erythrophlein sulphate, 1:50,000, *via* inferior vena cava

was beautifully crystalline, and when heated in a capillary tube immersed in an oil bath it began to soften at  $68^{\circ}\text{C}$ , became a clear viscous mass at  $88^{\circ}\text{C}$ , and decomposed with evolution of gas at  $140^{\circ}\text{C}$ . The substance reduced Tollen's reagent but gave negative results with Legal, Liebermann-Burchard and Sakaguchi tests. Combustion analyses yielded the following figures

C 59.12, H 8.24, N 3.12, S 2.42

C 59.15, H 8.31, N 3.09, S 2.53

It is possible that Harnack's empirical formula (8),  $\text{C}_{28}\text{H}_{43}\text{NO}_7$  or  $\text{C}_{28}\text{H}_{45}\text{NO}_7$ , needs revision.

By perfusion into the inferior vena cava in frogs according to the method of Howell and Cooke (9), A-V dissociation and ventricular systolic standstill were demonstrated, as shown in Fig 1. Convincing evidence of the digitalis-like action of erythrophlein sulphate on the mammalian heart such as that of the cat was recorded on the electrocardiogram by following the technique previously described (10), a 1:50,000 solution being injected intravenously at the rate of 1 cc per minute. Figure 2 may be taken as an example to illustrate P-R prolongation, bradycardia, ectopic rhythm, secondary tachycardia, and finally ventricular fibrillation. In addition, the alkaloid caused nausea and vomiting in both pigeons and cats so that there is no doubt about its digitalis-like effect.

Regarding uzarin Gessner (11) observed systolic standstill of the amphibian ventricle either by perfusion or *in situ*. In our studies it was found that in frogs (*Rana pipiens*) a 1:5000 solution perfused into the inferior vena cava caused a moderate slowing of the heart rate and some decrease in amplitude of contractions, but no systolic stoppage. By injection into the lymph sac in frogs, however, large doses induced systolic standstill.

1 *The Hatcher-Brody Method (12)*—The solutions of the substances were so adjusted that when injected into the femoral vein at the rate of 1 cc per minute they would kill a cat weighing less than 3 Kg within about 1½ hours. This time limit was arbitrary but seemed to be

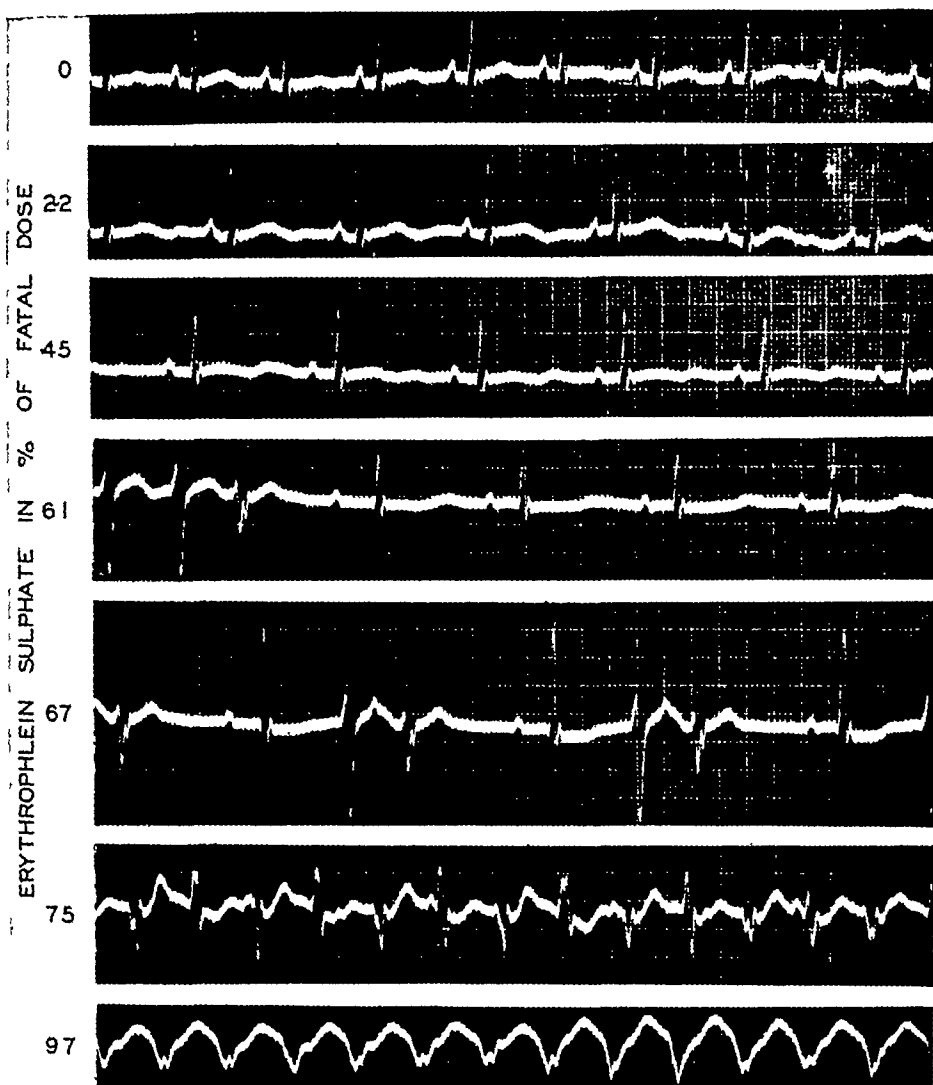


Fig 2—Electrocardiographic Changes Caused by Erythrophlein. Cat No 1392 female, weighing 2.068 Kg, was anesthetized by ether. Erythrophlein sulphate in 1:50,000 solution was injected into the femoral vein at the rate of 1 cc per minute. A total of 28 electrocardiograms was taken from lead II at different stages of this experiment. Only 7 selected tracings are shown in the figure. The abscissal time lines make divisions equal to 0.02 and 0.10 second, and the ordinates those representing 0.0001 and 0.0005 volt.

suitable for both the easily eliminated compounds, such as ouabain, and the slowly acting ones, such as digitoxin. A stethoscope was used for the determination of the end point. A group of 10 or more animals was employed in order to obtain an average of some statistical significance. The results are shown in Table I and summarized in Table IV. It should be noted that ouabain,

which for a long time has been known as the most potent of all cardiac glucosides, now ranks third according to the cat unit. The superiority of convallatoxin to ouabain in frogs has been noted by Karrer (13). Previously (1), it was shown that four bufagins were more powerful than ouabain. It may also be pointed out that in a series of 53 animals the cat unit of thevetin was found to be 0.92 mg. per Kg. as compared with 0.85 mg. in 16 cats, which has been reported before (14). The potency of uzarin is very low and variable. As indicated in Table I the cat unit varied from 1.83 to 8.33 mg. per Kg. the average being 5.08 mg. There were 2 cats which did not die even with 14.5 and 13.2 mg. per Kg., respectively. They were not included in the table. Apparently certain animals can tolerate huge doses of uzarin without fatal outcome. The cat unit of digoxin in our series of experiments is equal to just one half of that reported by White (15). Without knowing the strength of his solution and speed of his injection it is difficult to account for the discrepancy.

2 *The U. S. P. Frog Method* (16)—The results by this well known method are given in Tables II and IV. As a whole they bear out the same order of activity of the different substances as that obtained by the cat method except that thevetin in frogs proves to be more powerful than digitoxin and erythrophlein while in cats the reverse is true. Quantitatively, the two methods do not yield the same ratio of activity among the different principles. For example, convallatoxin is fully 38 times as active as digitoxin in frogs, but is only 4.3 times as potent as the latter in cats. In some instances the difficulty of absorption in frog's lymph sac apparently accounts for the differences but in a few cases, especially with erythrophlein, the material may be actually less poisonous to frogs than to cats.

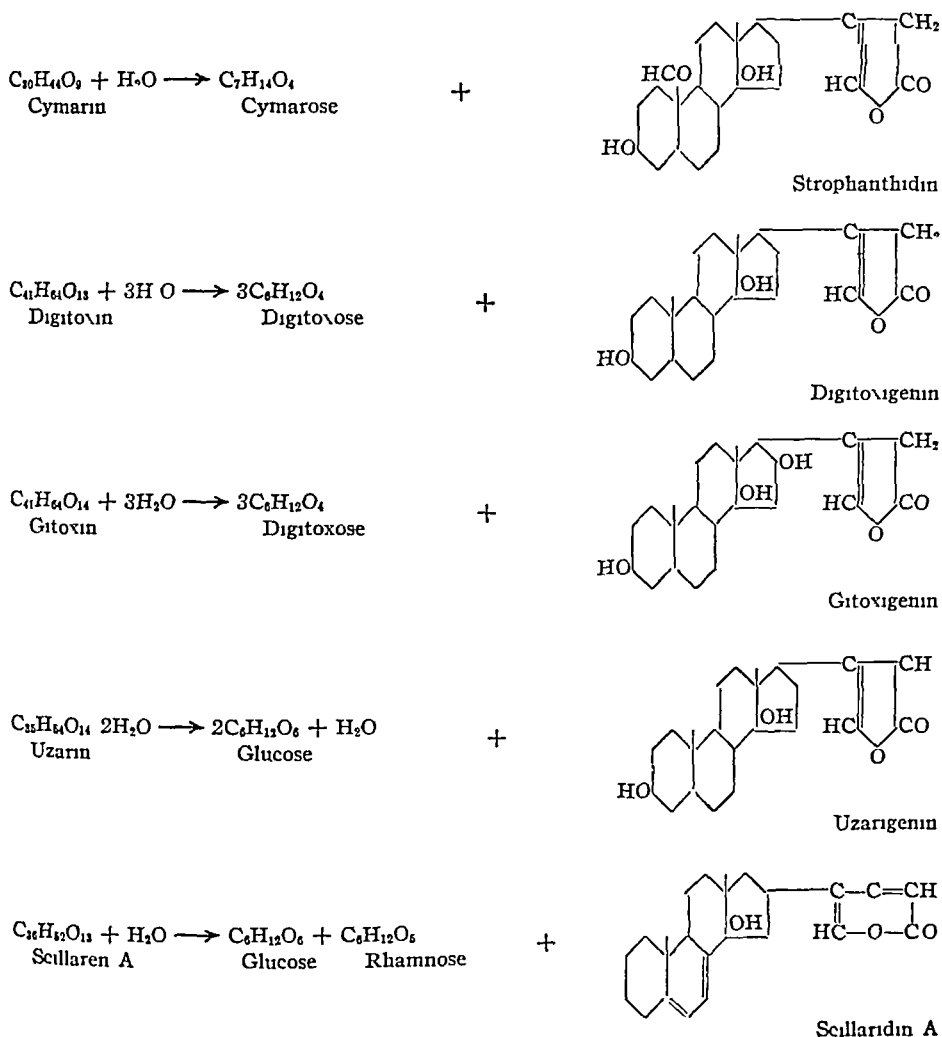
3 *The Cat Minimal Emetic Dose*—In previous reports (1), (17), mention was made of the minimal emetic doses of several substances. More complete and detailed data are presented in Table III. With convallatoxin,  $\beta$  antiarrin and ouabain, a 1:2000 solution was adopted but with the remaining compounds a 1:1000 solution was employed. All injections were made intravenously in unanesthetized cats. Vomiting occurred in 10 to 15 minutes in the majority of instances but with digitoxin it was often delayed for 30 to 50 minutes, indicating its slowness of action. An examination of Table IV at once shows that the emetic effect does not follow the cardiac action, a phenomenon already observed by Eggleston and Hatcher (18). According to our data uzarin is the most powerful in causing vomiting. A dose equivalent to about 7 per cent of the average cat unit rapidly injected was sufficient to induce emesis in the majority of animals. Erythrophlein sulphate on the other hand, required 81 per cent of the average cat unit as its minimal emetic dose. With the remaining substances, they varied from 24 to 75 per cent of their respective cat units.

4 *Persistence of Action*—By determining the fatal dose under ether anesthesia at various intervals after the initial injection in those cats which were used for the emesis test, information may be obtained regarding how long each substance stays in the body or is fixed in the heart. In other words the persistence of action. Digitoxin was found to have the most prolonged effect for 38 per cent of the cat unit persisted for more than 5 days. Digoxin, cymarol, convallatoxin and erythrophlein sulphate proved to be relatively persistent since one half of the cat unit in each case remained in the circulation for 1 to 7 days.  $\beta$  Antiarrin, ouabain, thevetin and scillaren A were more rapidly eliminated. The least persistent drug was uzarin because 50 per cent of the cat unit often disappeared within an hour. The order of persistence of these substances is therefore digitoxin, digoxin, cymarol, convallatoxin, erythrophlein,  $\beta$  antiarrin, ouabain, thevetin, scillaren A and uzarin.

## DISCUSSION

Table IV clearly indicates that there is a disagreement of the results by three different methods of assay. It appears that digitoxin and erythrophlein are inherently more potent to feline than to amphibian hearts. The cat minimal emetic dose does not follow the frog's minimal systolic dose or cat unit. These data will be of importance from a therapeutic point of view, for none of the newer products should be applied to men unless their exact potency is known. The clinicians in this country appear to prefer the cat unit instead of the frog minimal systolic dose (19), (20).

The results are also interesting from a chemical point of view. It is now well known that upon hydrolysis the cardiac glucosides yield aglucones of  $C_{23}$  derivatives and one or more molecules of a sugar or sugars (21), (22), (23), (24). Scillaridin A, the aglucone of scillaren A, however, conforms to the  $C_{24}$  formula (25). Furthermore, many of the bufagins which occur in toad poisons and which are closely related to aglucones, do not have the  $C_{23}$  pattern (17). The structural formulas of several aglucones have been proposed and in certain instances established with certainty. They are derivatives of cyclopentenophenanthrene with an unsaturated lactone side chain. A consideration of our results in light of the following equations should be, therefore, of some interest. These structural formulas were suggested by Jacobs and Elderfield (26), Kon (27), Tschesche and Bohle (28), Tschesche and Haupt (29), Stoll, Hofmann and Helfenstein (25), Smith (30) and Elderfield (31).





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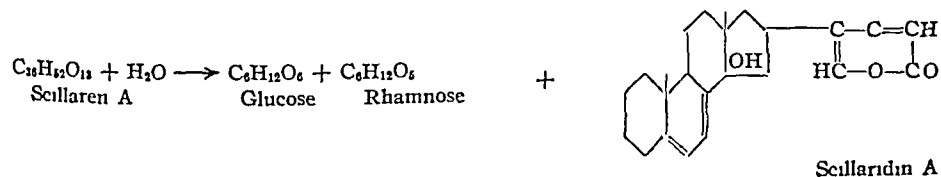
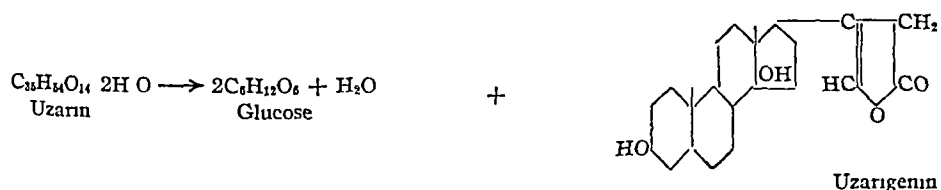
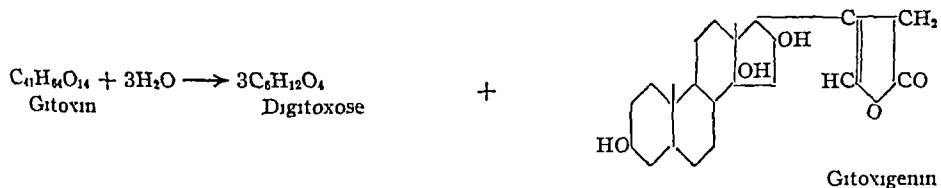
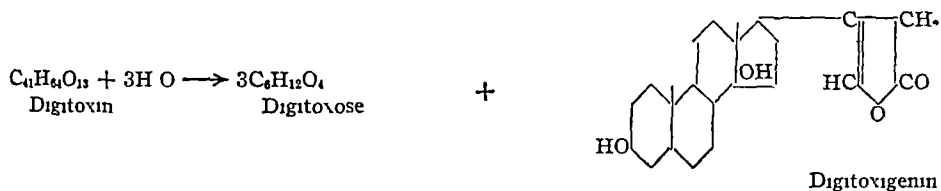
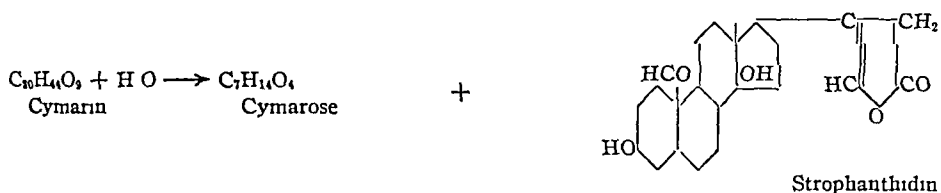
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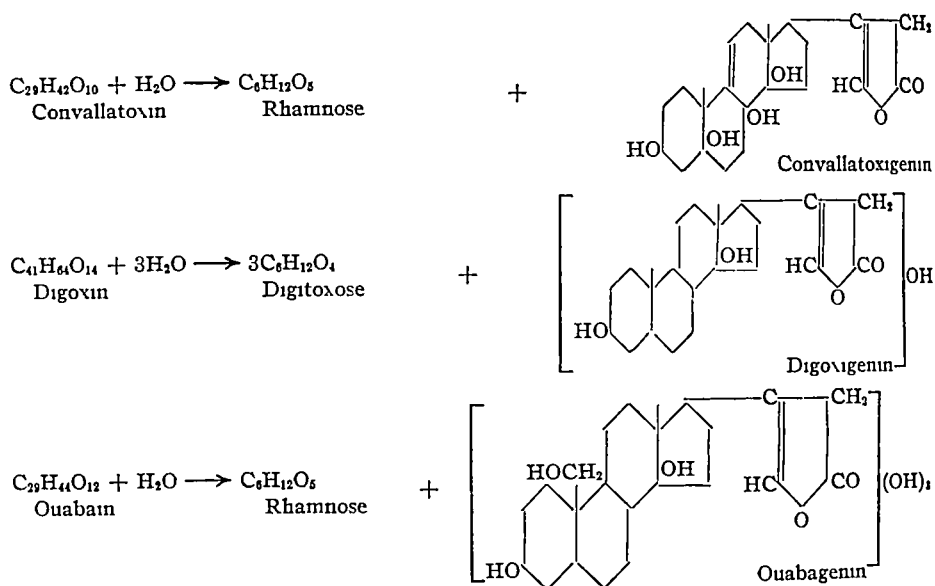
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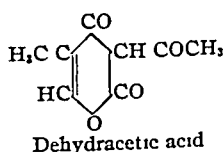
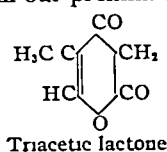
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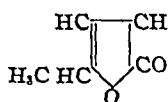
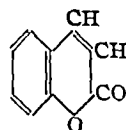
The results are also interesting from a chemical point of view. It is now well known that upon hydrolysis the cardiac glucosides yield aglucones of  $C_{23}$  derivatives and one or more molecules of a sugar or sugars (21), (22), (23), (24). Scillaridin A, the aglucone of scillaren A, however, conforms to the  $C_{24}$  formula (25). Furthermore, many of the bufagins which occur in toad poisons and which are closely related to aglucones, do not have the  $C_{23}$  pattern (17). The structural formulas of several aglucones have been proposed and in certain instances established with certainty. They are derivatives of cyclopentenophenanthrene with an unsaturated lactone side chain. A consideration of our results in light of the following equations should be, therefore, of some interest. These structural formulas were suggested by Jacobs and Elderfield (26), Kon (27), Tschesche and Bohle (28), Tschesche and Haupt (29), Stoll, Hofmann and Helfenstein (25), Smith (30) and Elderfield (31).





The most significant feature is that uzarin, which has an aglucone isomeric with digitoxigenin, has a very feeble cardiac action. The difference in steric arrangements probably accounts for the difference in their activity. Among the active members, the variation in potency is very great. For example, digoxin is 275 per cent, and digitoxin 412 per cent, less powerful than convallatoxin, gram for gram. It is possible that the two hydroxyl groups on C<sup>5</sup> and C<sup>8</sup> and the double bond between C<sup>9</sup> and C<sup>11</sup> in the convallatoxinogenin molecule are of significance in contributing to the high potency of convallatoxin. One is tempted to postulate that the presence of a carbinol group on C<sub>10</sub> in the aglucone molecule of ouabain, and that of an aldehyde group on the same C-atom in the aglucone molecule of cymarín are also favorable to the high cardiac activity of the two substances. The sugar component alone has no action on the heart, but when conjugated with an aglucone it increases the potency (32). There is some suggestion from the results that the glucose containing glucosides are rapidly eliminated while the digitoxose- or cymarose containing members have a persistent action. The cyclopentenophenanthrene ring system apparently has no effect on the heart, for estrogenic hormones, bile acids and sterols have never been reported to stimulate the vagus or affect the myocardium like digitalis. The most important parts of the molecule are undoubtedly the double bond and the lactone ring, for hydrogenation and saponification both result in loss of activity (33), (34), (35), (36). It will be interesting to investigate pharmacologically the lactone side chains ( $\alpha$ -pyrone and 2,3-dihydro- $\alpha$  furone) of certain aglucones without the sterol ring system attached to them. The simple unsaturated lactones as listed below are devoid of any digitalis-like action, as concluded from our preliminary studies



 $\alpha$ -Angelica lactone

Coumarin

The digitalis-like action of the alkaloid erythrophlein is of unusual interest. The negative Sakaguchi test indicates that the compound does not belong to the group of bufotoxins which also contains nitrogen. The failure of the sodium nitroprusside test makes it deviate from the constitution of common aglucones. As yet, there is no evidence that erythrophlein is a derivative of cyclopentenophenanthrene. The elucidation of its structure may thus lead to the discovery of another type of substances having a digitalis-like action but differing structurally from aglucones, bufagins and bufotoxins.

## SUMMARY

The potency of 11 crystalline digitalis-like substances—convallatoxin,  $\beta$ -antiarin, ouabain, cymarín, scillaren A, digoxin, digitoxin, erythrophlein sulphate, thevetin, uzarin and gitoxin—has been compared under the same conditions by the cat unit, the frog minimal systolic dose and the cat minimal emetic dose. Both convallatoxin and  $\beta$ -antiarin are more powerful than ouabain. The cat unit of thevetin should be revised to  $0.92 \pm 0.035$  mg per Kg instead of 0.85 as previously reported.

The emetic action does not run parallelly with the cardiac action. Uzarin having the least cardiac effect is very highly efficient in causing vomiting.

The order of persistence of action from high to low is digitoxin, digoxin, cymarín, convallatoxin, erythrophlein,  $\beta$ -antiarin, ouabain, thevetin, scillaren A and uzarin.

Gitoxin is so insoluble in alcohol and water that its cardiac action cannot be accurately determined.

The significance of certain chemical structures with reference to their pharmacological activity has been discussed.

TABLE I—CAT UNITS OF 10 CARDIAC PRINCIPLES OF PLANT ORIGIN

Drug	Solu- tion	Cat No	Sex	Weight Kg	Fatal Dose Mg per Kg	Drug	Solu- tion	Cat No	Sex	Weight Kg	Fatal Dose Mg per Kg
Convallatoxin	1:400,000	1438	M	2.477	0.06	Digitoxin	1:100,000	491	M	1.459	0.37
		1439	F	1.848	0.06			492	M	1.944	0.32
		1440	F	1.889	0.08			494	F	1.590	0.34
		1441	F	2.537	0.08			495	M	1.452	0.41
		1442	M	2.798	0.08			496	M	1.608	0.28
		1445	F	2.489	0.06			501	F	1.647	0.34
		1449	F	2.261	0.09			502	F	1.800	0.34
		1450	F	2.406	0.10			503	M	1.512	0.27
		1451	F	1.707	0.07			504	F	1.972	0.31
		1452	F	1.823	0.08			505	M	1.733	0.31

TABLE I —CAT UNITS OF 10 CARDIAC PRINCIPLES OF PLANT ORIGIN —(Continued from page 585)

Drug	Solu- tion	Cat No	Sex	Weight Kg	Fatal Dose Mg per Kg	Drug	Solu- tion	Cat No	Sex	Weight Kg	Fatal Dose, Mg per Kg
$\beta$ Antiarin	1 200 000 and 1 100,000	1444	F	2 381	0 13	Erythrophlein Sulphate	1 50,000	506	F	1 891	0 29
		1446	F	1 632	0 11			538	F	1 519	0 36
		1447	F	1 915	0 12			1169	F	1 650	0 48
		1448	F	2 737	0 12			1170	M	2 064	0 42
		1453	F	2 543	0 07			1171	M	2 740	0 34
		1454	M	2 879	0 10			1172	F	2 310	0 55
		1455	F	2 227	0 09			1173	F	2 245	0 34
		1456	F	2 634	0 12			1174	M	2 210	0 30
		1457	F	2 120	0 09			1175	F	2 758	0 36
		1458	M	2 076	0 09			1176	F	2 470	0 38
		30	F	2 290	0 14			1177	M	3 060	0 28
		31	F	1 830	0 15			1178	M	2 651	0 32
		32	F	2 264	0 09			1179	F	2 052	0 30
		33	M	1 846	0 10			1070	M	2 124	0 85
		34	F	2 815	0 11			1071	M	1 800	0 69
		35	F	2 417	0 14			1072	M	1 880	0 67
		36	F	2 171	0 14			1073	F	1 785	0 70
		37	F	2 703	0 10			1074	F	2 274	0 83
		40	M	2 353	0 13			1079	F	2 186	0 79
Ouabain	1,100 000	41	M	2 660	0 11	Thevetin	1 20 000	1080	F	1 775	0 79
		42	M	2 967	0 12			1081	M	1 992	0 81
		43	M	1 846	0 14			1082	F	1 762	1 36
		44	F	2 828	0 12			1083	M	1 808	0 77
		45	F	1 750	0 12			1084	F	2 140	1 36
		98	M	2 157	0 11			1085	F	2 060	0 67
		99	M	2 263	0 12			1086	F	2 850	1 24
		100	M	2 135	0 12			1089	M	1 536	0 62
		101	M	2 155	0 13			1090	M	3 300	0 59
		102	M	1 928	0 11			1091	M	1 720	0 80
		129	M	2 114	0 11			1291	M	2 436	0 93
		130	F	2 286	0 11			1290	F	2 314	1 04
		131	F	2 215	0 11			1229	F	2 370	0 63
		558	M	1 492	0 15			1228	F	2 855	0 60
		559	F	1 411	0 13			1259	F	1 690	1 14
		560	F	1 713	0 12			1257	F	2 184	0 84
		561	M	2 409	0 11			1256	F	2 292	0 61
		562	F	1 880	0 17			1260	M	1 951	0 80
		563	M	2 011	0 12			1258	F	1 533	0 72
		564	F	1 958	0 10			1253	F	2 209	0 63
		565	M	1 826	0 13			1254	M	2 480	0 65
		566	M	1 553	0 13			1255	F	2 111	1 14
		567	M	1 790	0 10			1244	F	2 422	1 75
		699	F	2 330	0 10			1242	F	2 837	0 68
		698	M	2 273	0 09			1240	F	2 495	1 00
		700	M	2 280	0 13			1241	M	1 910	0 78
		701	F	2 261	0 12			1238	M	2 070	0 94
		702	F	1 990	0 12			1236	F	1 924	0 77
		1144	F	1 793	0 15			1237	F	2 470	1 20
		1145	F	1 830	0 14			1269	F	2 157	1 16
		1146	M	2 151	0 15			1264	F	2 607	1 72

Cymarin	1 100,000	1147	M	2 360	0 12	1266	M	2 739	1 34
		1148	M	2 333	0 11	1265	F	2 457	1 17
		1149	F	1 646	0 12	1263	F	2 185	0 99
		1150	F	1 962	0 12	1262	M	2 697	1 03
		1151	F	1 964	0 11	1261	F	2 423	1 47
		1152	F	1 990	0 11	1271	F	2 177	0 88
		1153	F	2 034	0 12	1270	F	2 260	1 19
Scillaren A	1 100,000	1154	F	1 822	0 13	1280	F	2 006	0 98
		594	F	1 762	0 19	1278	F	2 128	1 06
		595	F	2 608	0 09	1224	F	3 215	0 83
		596	M	1 770	0 16	1223	M	3 025	0 56
		597	F	1 765	0 16	1166	F	2 290	0 88
		598	M	1 827	0 21	1165	M	1 818	0 99
		602	F	2 073	0 15	1168	F	2 283	0 81
		603	M	1 612	0 15	1167	M	2 116	0 91
		604	F	1 749	0 14	1109	F	2 196	0 83
		605	F	2 155	0 11	1110	F	1 955	0 87
Digoxin	1 100,000	606	F	1 700	0 15	1111	F	2 260	0 76
		1198	M	2 265	0 28	1106	M	2 145	0 82
		1199	F	1 955	0 28	1107	F	2 773	1 15
		1200	M	2 290	0 17	1108	F	2 833	0 74
		1201	M	2 528	0 26	1402	F	1 889	3 07
		1202	M	1 882	0 25	1403	F	1 960	6 72
		1203	F	2 075	0 23	1404	F	1 764	2 91
		1204	F	1 910	0 21	1405	M	1 600	1 83
		1205	F	1 830	0 24	1406	F	1 565	5 98
		1206	M	2 538	0 17	1407	F	2 543	3 85
Uzarin	1 3000	1207	M	1 830	0 22	1410	F	2 537	7 96
						1418	F	2 100	3 62
						1420	F	2 023	6 52
						1421	F	2 717	8 33

TABLE II—FROG MINIMAL SYSTOLIC DOSES OF 10 CARDIAC PRINCIPLES OF PLANT ORIGIN

Drug	Solution	Dose Mg per Kg	No. in Systolic Standstill/ No. of Frogs Used
Convallatoxin	1 40,000	0 00014	0/4
		0 00018	2/8
		0 00021	3/4
		0 00025	3/4
		0 00032	1/4
$\beta$ Antiarin	1 20,000	0 00035	1/4
		0 00039	10/16
		0 00043	4/4
		0 00040	0/4
		0 00045	0/4
Ouabain	1 20 000	0 00050	3/4
		0 00055	4/4
		0 00050	0/4
		0 00055	0/4
		0 00060	3/4
Cymarin	1 20 000	0 00065	3/4
		0 00070	4/4
		0 00065	0/7
		0 00070	7/12
		0 00075	4/7
Scillaren A	1 20 000		

TABLE II —(Continued from page 587)

Drug	Solution	Dose Mg per Kg	No. in Systolic Standstill/ No. of Frogs Used
Digoxin	1 5000	0 00225	1/4
		0 00250	3/4
		0 00300	7/8
		0 00650	0/4
		0 00700	3/12
Digitoxin	1 2000	0 00750	4/8
		0 00800	6/8
		0 00850	4/4
		0 01000	1/4
		0 01100	5/8
Erythrophlein Sulphate	1 1000	0 01200	3/4
		0 01300	7/8
		0 00400	0/12
Thevetin	1 2000	0 00450	18/24
		0 00500	7/8
		1 00000	1/4
Uzarin	1 50	1 10000	0/1
		1 20000	0/1
		1 30000	0/1
		1 40000	0/3
		1 50000	2/3

TABLE III —MINIMAL EMETIC DOSES OF 10 CARDIAC PRINCIPLES OF PLANT ORIGIN IN CATS

Drug	Dose Mg per Kg	No. of Cats Vomited/ No. of Cats Used
Convallatoxin	0 050	0/2
	0 060	2/3
	0 070	2/3
	0 080	2/2
$\beta$ Antiarin	0 030	0/3
	0 040	2/2
	0 050	2/2
Ouabain	0 050	0/2
	0 060	2/3
	0 070	2/2
Cymarin	0 070	0/3
	0 080	3/3
	0 090	2/2
Scillaren A	0 080	1/3
	0 090	1/3
	0 100	2/2
Digoxin	0 060	0/2
	0 070	2/2
	0 080	2/3
Digitoxin	0 100	0/2
	0 125	1/3
	0 150	2/2
Erythrophlein Sulphate	0 200	0/2
	0 250	1/3
	0 275	1/3
	0 300	2/2

	0 200	0/2
	0 225	2/3
Thevetin	0 250	2/2
	0 275	2/2
	0 300	2/2
	0 300	0/2
	0 325	0/2
Uzarin	0 350	2/3
	0 400	1/1
	0 500	1/1

TABLE IV—SUMMARY OF ALL RESULTS

Drug	Cat Unit (Mean $\pm$ Probable Error) Mg per Kg	Frog Minimal Systolic Dose Mg per Kg	Minimal Emetic Dose in Cats Mg per Kg
Convallatoxin	0 08 $\pm$ 0 002	0 00021	0 060
$\beta$ Antiarr	0 10 $\pm$ 0 004	0 00039	0 040
Ouabain	0 12 $\pm$ 0 002	0 00050	0 060
Cymar	0 13 $\pm$ 0 003	0 00060	0 080
Scillaren A	0 15 $\pm$ 0 007	0 00070	0 100
Digoxin	0 22 $\pm$ 0 008	0 00250	0 075
Digitoxin	0 33 $\pm$ 0 008	0 00800	0 150
Erythrophlein Sulphate	0 37 $\pm$ 0 017	0 01100	0 300
Thevetin	0 92 $\pm$ 0 035	0 00450	0 225
Uzarin	5 08 $\pm$ 0 437	1 50000	0 350
Gitoxin*	Unable to determine	Unable to determine	Unable to determine

\* Insoluble

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## STRYCHNINE VI VARIATION IN PHYSIOLOGICAL ACTION OF C P STRYCHNINE \*

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For many years, men using strychnine alkaloid for the control of noxious rodents and predatory animals have noticed variation in the results obtained. The earlier explanations were that variations in field and animal conditions or in the methods of placing the poison baits were responsible. It was incredible that a substance as chemically stable as strychnine would not be uniform in its toxic properties. Wide-spread complaints, traceable to the same lot of poison, have become so prevalent within the past few years, however, that we have been forced to recognize the probability that something was wrong with those lots.

Since we had, for several years, been running tests for the "free base," and the crystal size of the incoming lots of alkaloid, we made an attempt to associate the per cent of free base or the physical size of the particles with the reported troubles. There was no correlation—in fact, the alkaloid carrying the lowest free base very often proved the most efficient toxic agent, and the crystal size was entirely too variable a factor for any conclusions to be drawn. The most toxic alkaloids and the least toxic were often practically the same size—either large or small.

During the past few years, the Denver laboratory has tested biologically 27 lots of the alkaloid, originating from five wholesale distributors. Our system of tests has been by means of stomach tube to white rats. A test suspension of the alkaloid in the concentration of 1 mg of strychnine to each cc of suspension was made with the assistance of 1 per cent acacia. The animals to be used were weighed and divided into comparable series. The doses were computed for each animal, and the dose for the first rat measured out in a hypodermic syringe. The animal was then placed on a holding board and a wooden gag, having a  $\frac{3}{16}$ " hole in it, was placed in its mouth. A No 8 soft rubber catheter was then passed through the hole in the gag into the animal's stomach. The syringe was shaken to insure

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uniform suspension, and the dose administered. A 1-cc rinse was forced through the catheter, which was then removed, and the animal placed back in the cage for observation. The time at which the dose is administered, and that of the first spasm are recorded, as well as the time until the stoppage of the heart.

We use 25.00, 22.50, 20.00, 17.50, 15.00, 12.50, 10.00, 7.50 and often 6.00 mg per Kg body weight as our standard series of doses for preliminary trials. Two rats are desired for each dose in preliminary work, and ten for each in confirmatory tests. Certain digressions from this plan were necessary during the work herein reported, owing to lack of sufficient uniform animals.

Table I shows the differences in the physical and chemical examinations, as well as the variations in killing ability of these poisons. From this table it appears that fifteen of the twenty-seven alkaloids were tested on eleven or more animals. The other twelve samples were tested on five animals to the series, and are consequently useful largely for corroborative data. It also appears that Samples A-1 and B-1 show the greatest difference in toxicity. A careful study of these extremes was made to confirm our observations of a more general nature. Table II gives our tests with these two alkaloids in detail.

TABLE I —CHEMICAL AND BIO ASSAY OF STRYCHNINE ALKALOIDS

Manufacturer	Sample Number	Alkaloidal Content %	LD <sub>100</sub> % Rats	Mg /Kg
A	1	99.31	Over	25
	2		Over	25
	3			20
	4			20
	5			17.5
	6			17.5
	7			15
	8			15
	9			12.5
	10	99.70	Below	10
B	1	98.86		7.5
	2	98.91		7.5
C	1	98.68		20
	2			15
	3			12.5
	4			7.5
	5			7.5
	6			7.5
D	1	98.28 99.30		20
	2			15
	3			15
	4			15
	5			12.5
	6			10
E	1	98.60		12.5
	2			10
	3			7.5

To demonstrate that this wide variation is not altogether due to possible faulty technique or to an unexpectedly wide difference in physiological responses,

TABLE II.—COMPARATIVE TOXICITY OF STRYCHNINE ALKALOIDS A-1 AND B-1, STOMACH TUBE ADMINISTRATION TO WHITE RATS

Sample	2.0		20.0		15.0		12.5		10.0		7.5	
	T/S:	T/D:	T/S	T/D	T/S	T/D	T/S	T/D	T/S	T/D	T/S	T/D
A-1—I	11 0	18 0	S <sup>1</sup>	S	S	S	S	S	S	S	7 0	10 0
II	4 5	6 5			6 0	9 5					8 5	9 5
	5 0	8 0			6 5	10 5					14 0	19 0
	7 5	9 0			7 0	9 0					18 0	28 5
	8 0	12 0			7 0	10 0					26 0	31 0
	8 0	16 0			12 5	20 0					S	S
	8 0	19 0			13 0	31 0					S	S
	9 0	10 5			15 0	21 0					S	S
	13 5	33 0			16 0	23 5					S	S
	16 0	32 0			24 0	32 0					S	S
	S	S			39 5	42 5					S	S
	S	S										
Av II	8 8	16 2			14 7	20 9					14 7	19 6

B 1—I	8 0	13 0	9 0	15 0	12 0	15 0	9 0	13 0	10 0	15 0	6 5	8 5
II	5 0	8 5			4 0	5 0					7 0	15 5
	6 0	7 0			4 0	5 5					9 0	13 0
	6 0	7 5			5 0	14 0					9 5	12 0
	6 0	12 0			6 5	8 5					11 5	18 0
	6 0	12 0			8 0	11 0					12 0	23 0
	6 5	8 5			9 5	14 0					12 5	15 5
	7 5	12 0			12 0	17 0					16 0	32 0
	8 0	12 0			15 0	17 0					26 0	27 5
	14 0	16 0			16 0	18 5					S	S
	15 0	16 5			20 0	21 0					12 2	18 3
Av II	8 0	11 20			10 0	13 2						

FOOTNOTE <sup>1</sup> T/S denotes time in minutes between administration and spasm  
<sup>2</sup> T/D denotes time in minutes between administration and death  
<sup>3</sup> S denotes survived

TABLE III.—COMPARATIVE TOXICITIES OF A-1 AND B 1 AS THE SULPHATES INTRAPERITONEAL INJECTIONS TO WHITE RATS

Sample	10.00		7.0		5.0		Dose 4.0		Mg/Kg 3.5		T/S <sup>2</sup> T/D	
	T/S	T/D	T/S	T/D	T/S	T/D	T/S	T/D	T/S	T/D	T/S	T/D
A-1 2 0	5 0	1 0	3 0-4 0	9 0-8 0	4 0-4 0	5 0-6 0	7 0	21 0	4 0	7 0	8 0-14 0	20 0-16 0
B 1 3 0	5 0	3 0	4 0	3 0-2 0	15 0-3 0	5 0-2 0	12 0-4 0	3 0	5 0	9 0	15 0	12 0
Av A-1	T/S—5 5				Av B 1	T/S—4 4						
	T/D—10 6					T/S—0 0						

we prepared the sulphates from the two alkaloids and administered the solutions of these salts by intraperitoneal injection. Table III gives the results of this test. This tabulation shows that although the differences are smaller, they are still in the same direction.

A further test was made using laboratory-recrystallized alkaloids in comparison with the original commercial products. Six different lots of the commercial material were recrystallized in the laboratory and the twelve lots of poison thus obtained were tested. The laboratory-recrystallized product had a fairly uniform crystal size, whereas the original alkaloids were decidedly variable. The commercial alkaloid and the laboratory crystals from that alkaloid did not show any difference in toxicity.

#### CONCLUSIONS

1 Commercial strychnine alkaloids of C P quality show definite and marked differences in toxicity.

2 These differences are of such magnitude that serious variation in results are noted in their use in economic poisons.

3 These differences have not been associated with determinable changes in chemical or physical properties.

4 Recrystallization of the various alkaloids does not alter their lethal efficiency.

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#### THE INFLUENCE OF CERTAIN SALTS ON MORPHINE TOXICITY AND NARCOSIS IN MICE AND RATS \*

BY J M ORT AND W G CHRISTIANSEN <sup>1</sup>

The study of synergism and antagonism among drugs has, admittedly, many fascinating theoretical and practical possibilities. In the field of morphine pharmacology, for instance, it is conceivable that certain drugs exist which can greatly potentiate the action of morphine in all of its manifestations, thus decreasing the dosage required. But, much more important, such a potentiator may some time be found which will affect only the narcotic action of the drug or at least will not proportionally increase its vicious habit-forming effects.

The influence of atropine on the activity of morphine is, of course, well recognized. F Schmitz, for example, studied not only atropine in this connection but also lobelia, coramine, cardiazole, hexetone and pyramidon. (On the influence of central nervous stimulants on morphine poisoning (1).) W Peters has reported that antipyrine is a morphine synergist. (A morphine-sparing ampul preparation (2).)

Bancroft (3) and his co-workers have made a most extensive study in this field, making use of the facts and theories of the modern science of colloid chemistry to expand the theory of anesthesia and the behavior of nervous tissues originally proposed by Claude Bernard. The essence of this theory is that anesthesia or narcosis results when the colloids of the cells of the nervous tissues are either abnormally reversibly dispersed or coagulated.

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\* Scientific Section, A Ph A, Portland meeting, 1935.

<sup>1</sup> Research Department of the Chemical and Pharmaceutical Laboratories E R Squibb and Sons, Brooklyn N Y.

According to Bancroft's views morphine produces its effects by reversibly coagulating the cell colloids of the nervous system. These cells in the morphine addict, then, are over-coagulated. Morphism, therefore, should yield to drugs which tend to disperse the cell colloids. The long recognized sedative action of bromides must be due to the ability of bromides to peptize the colloids of nerve tissue cells, to which property is also due whatever success has been realized in the treatment of morphism with bromides. This theory demands that a drug which is a coagulating agent will serve to aggravate the effects of morphine and to prolong its action. Thus he found that sodium tartrate would appreciably prolong the effect of morphine in rabbits while sodium thiocyanate had the opposite effect in both rabbits and dogs.

The actual therapeutic value of sodium thiocyanate as an aid in restoring morphine addicts to health and happiness, the subject of considerable discussion and difference of opinion, need not be discussed in this paper. The importance of the fundamental principles involved, however, seemed to us to be so great as to justify still further pharmacological study. As the peptizer or disperser to test, we chose sodium thiocyanate, on which so much work has already been done by Bancroft. We selected mono-sodium phosphate as an example of a coagulator and sodium chloride as a somewhat intermediate compound. Morphine hydrochloride and acid phosphate were tested separately for comparison. Mice and rats were chosen as the test animals in order to make feasible a larger number of experiments, thus minimizing as far as possible the significance of individual biological variations.

There is, of course, a species difference in the response of various animals to morphine. Nevertheless, morphine is certainly a narcotic drug for mice and rats, and the fundamentals of its action in these animals must be considered as essentially parallel to those in man and the higher animals. Two things were investigated: toxicity and narcotic effect. The toxicities of the various combinations tested were determined in mice in terms of the M. L. D. of the morphine content of the combinations, that is, the single dose in mg./Kg. which will kill half of the animals receiving subcutaneous injections.

The narcotic activities of the various combinations tested were determined in several ways. L. Maier ("Quantitative Determination of Morphine by Bioassay" (4)) has further developed the method of Straub and Herrman in which the presence of morphine is manifested by the animal drawing up its tail over its back in an S-shape. The time between the injection and the onset of the reaction is recorded, as is also the duration of the reaction. O. W. Barlow in "The Tranquillizing Potency of Morphine, Pantopen, Codeine, Papaverine and Narcotine" (5) confined rats on their backs on boards and recorded their movements after their first excitement had worn off. Threshold or higher doses of the drugs decrease the number of these movements in a given period of time. We have found a tail pressure method to give perhaps the most accurate and consistent results of the three methods we tried. In this method a graduated cylinder containing mercury is carefully set on the rat's tail. By consecutive tests, the minimum height of mercury that will elicit a response from the animal is determined. As the morphine dosage is increased over the threshold dose, this height of mercury increases somewhat proportionally up to the point of complete anesthesia.

## EXPERIMENTAL RESULTS

All combinations tested were injected subcutaneously and prepared by adding the various ingredients to a 3% aqueous morphine hydrochloride solution in the proportion of 3 Gm ingredient to 1 Gm morphine hydrochloride, except that the morphine acid phosphate solution was prepared by adding 4 cc of normal phosphoric acid to 0.2 Gm of morphine alkaloid and then diluting to give a 3% solution

TABLE I—EFFECTS IN MICE

Material Injected	Mouse Toxicity		S Tail Reaction			
	No of Animals Injected	Approximate M L D Mg /Kg	Dose Mg /Kg Morphine Hydrochloride Equivalent	Incidence of Reactions	Averages for Animals in Which Reactions Occurred No of Minutes before Start of Reactions	Duration of Reaction in Minutes
Morphine Hydrochloride	65	300	5	3/15	37	120
			10	8/8	21	141
Morphine hydrochloride + mono sodium phosphate	56	300	5	4/15	40	60
			10	8/8	28	116
Morphine hydrochloride + sodium sulphocyanate	49	90	5	10/16	40	65
			10	8/8	22	151
Morphine hydrochloride + sodium chloride	57	300	5	7/14	40	100
			10	8/8	38	101
Morphine acid phosphate	57	300	6	0/8		

TABLE II—NARCOTIC ACTIVITIES IN RATS

Material Injected	Tranquilizing Effect		Response to Tail Pressure					
	No of Rats Tested	Morphine Hydrochloride Equivalent Mg /Kg	Relative Average Number of Movements of the Group after Injection as Compared to the Group Average of 100 before Injection		Relative Pressure on Tail Required to Elicit Response after Injection as Compared to Pressure Necessary before Which Equals 100			
			End 1st hr		End 2nd hr		End 1st hr	
			End 1st hr	End 2nd hr	End 1st hr	End 2nd hr	End 1st hr	End 2nd hr
Morphine hydrochloride	5	1.67	60.3	39.1	100.2	122.2		
	10	2.50	60.3	52.8	159.0	97.0		
	10	3.75	45.2	60.3	236.8	211.0		
	10	5.00	29.4	43.0	260.9	210.9		
	10	7.50	28.9	29.5	513.1	351.8		
Morphine hydrochloride + mono sodium phosphate	5	1.67	50.0	33.3	133.0	143.0		
	5	3.75	44.7	25.0	188.4	157.6		
	5	7.50	4.8	34.9	578.4	299.4		
Morphine hydrochloride + sodium sulphocyanate	5	1.11	28.6	14.3	110.4	118.0		
	5	1.67	43.2	10.2	207.0	177.4		
	5	3.75	60.2	53.4	238.8	248.4		
	5	7.50	1.1	12.9	828.0	593.2		
Morphine hydrochloride + sodium chloride	5	1.67	127.4	9.1	108.4	115.4		
	5	3.75	69.8	37.2	241.4	206.0		
	5	7.50	30.7	58.0	285.0	190.8		
Morphine acid phosphate	5	1.67	51.5	12.1	149.4	111.5		
	5	3.75	48.7	30.8	208.2	166.8		
	5	7.50	0.0	0.0	326.0	299.8		
Controls	26		51.7	28.1	117.8	127.4		

## DISCUSSION

*Toxicity—Table I*—It was found that for all the combinations tested, except that containing sodium sulphocyanate, the curve of dosage administered-incidence of death flattened out noticeably above a dosage of 150 mg /Kg. This makes an exact determination of M. L. D. for such combinations not only difficult but, for practical purposes, somewhat meaningless. No significant difference in M. L. D. could be determined among these four combinations. No consistent correlation could be detected between the incidence of death at a given dosage and the recent dietary history of the animals, *i. e.*, whether or not the animals had been fasted for 16 to 24 hours immediately preceding the test.

The results with the mixture of sodium sulphocyanate and morphine were much more sharp and consistent. The M. L. D. for this combination was definitely between 75 and 115 mg /Kg. and approximately at 90 mg /Kg. Thus our tests have shown that sodium sulphocyanate markedly increases the toxicity of morphine in mice when the two are injected simultaneously.

*"S" Tail Reaction in Mice—Table I*—We found no outstanding difference in the behavior of the combinations, except that the morphine acid phosphate combination gave no response in the dosage tried. Certainly there is no evidence that mono sodium phosphate potentiates morphine in mice or that sodium sulphocyanate antagonizes it. The results obtained by this method are apt to be irregular and inconsistent when intermediate doses are tested.

*Tranquility Effect in Rats—Table II*—While this method also gave somewhat inconsistent results, it can again be seen that sodium sulphocyanate certainly does not appear to antagonize the action of morphine. The action of phosphates is seen to be irregular. With small dosages of morphine, there was little evidence of potentiation. In the largest dose tested, the tranquilizing effect of the morphine was increased by the phosphate at the end of the first hour—but so was it with sodium sulphocyanate.

*Pressure on Rats' Tails Required to Elicit Responses—Table II*—This method gave us the most consistent results of the three methods tried. Comparing the effects, concentration by concentration, it is seen that, on the whole, both marked potentiation and marked antagonism of the morphine action are lacking. However, the most pronounced evidence of potentiation in this series of tests occurred with the combination of morphine and sodium sulphocyanate and the greatest evidence of antagonism was seen in the tests on morphine and sodium chloride mixtures.

## SUMMARY AND CONCLUSIONS

We are aware, of course, that, with respect to the relation between added ingredient and morphine, and to the dosage of morphine given, we have by no means studied exhaustively the possibilities of synergism and antagonism between morphine and sodium phosphate, chloride or thiocyanate. Our experiments were also confined to mice and rats. However, under the conditions of these experiments, we found on the whole no evidence of any marked increase or decrease of the action of morphine itself, either in the case of an added peptizer—sodium sulphocyanate—or added coagulators—mono sodium phosphate and sodium chloride.

If anything, sodium sulphocyanate showed some tendency to potentiate the effect of morphine. It undoubtedly considerably increased its toxicity, which might be expected of any substance which could potentiate morphine in all of its manifestations. Our results are not those which could be predicted from Bancroft's theory on the mechanism of the pharmacological actions of morphine, sodium sulphocyanate and mono-sodium phosphate.

We gratefully acknowledge the assistance of the Biological Research Laboratories of E. R. Squibb and Sons in which all the tests on rats and mice reported herein were carried out.

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### THE TOXICITY OF BARBITAL DERIVATIVES \*<sup>1</sup>

BY IVOR JONES<sup>2</sup> AND E. V. LYNN

Notwithstanding the large number of derivatives of barbituric acid which have been introduced into medicine, we have as yet only meager information as to comparative toxicity and efficiency. The textbooks make certain standard statements about the older ones which are not based upon existing evidence. Whatever reports can be found in the literature have originated largely in the laboratories of manufacturers, and the few unbiased records give very little data upon which the physician can base accurate judgment. The present study was designed as a start towards making such information available.

Of the marketed compounds seven of those most often used were selected for study. Barbital U. S. P. and phenobarbital U. S. P., introduced about 1904, dial, 1912, amytal, 1924, neonal, 1926, phanodorn, 1928, pentobarbital (nembutal), 1930.

The rabbit was chosen as the experimental animal because there seems no stated objection and several disadvantages have been found for other animals.

Using oral administration for rabbits, the M. L. D. in mg. per Kg. has been determined by Fitch and Tatum (1) as follows: Barbital 275, amytal 575, pentobarbital 175, phenobarbital 150, neonal 160, phanodorn 450. Roemer (2) gave for barbital 400. By subcutaneous injection in rabbits, the only results reported have been from the laboratories of Eli Lilly & Co. Barbital 290, amytal 110, neonal 100. Intraperitoneally, Fitch and Tatum (1) gave Barbital 225, amytal 90, pentobarbital 65, phenobarbital 150, neonal 115, phanodorn 130. Intravenously, Herwick and Knoefel (3) reported for barbital 250, for amytal 50. Intramuscularly, Louvier (4) gave for phenobarbital 150. As far as could be determined no one else has given any results on rabbits.

\* Scientific Section A. P. H. A., Washington meeting 1934.

<sup>1</sup> Seattle, Washington, June 19, 1934.

<sup>2</sup> Fellow of the National Conference on Pharmaceutical Research.



## ORAL ADMINISTRATION

In the present investigation there were used only healthy animals of mixed breeds and of both sexes weighing four pounds or over, the females being in all cases non pregnant No variation in results because of sex was noticed in the preliminary experiments

ORAL ADMINISTRATION				INTRAPERITONEAL INJECTION			
Drug	Dose Mg per Kg	Number of Animals	Result	Drug	Dose Mg per Kg	Number of Animals	Result
Barbital	300	4	S	Barbital	250	2	S
	350	4	1		275	2	S
	375	4	1		300	2	S
	400	4	D		325	2	S
Phenobarbital	100	4	S		350	2	S
	125	4	1	Phenobarbital	375	2	1
	140	4	2		385	2	D
	160	4	D		140	2	S
	450	8	S		150	2	1
Amytal	500	4	1		160	2	D
	525	4	1	Amytal	170	2	D
	550	2	S		90	2	S
	600	2	S		100	2	S
	650	2	S		110	2	D
	700	2	S		125	2	D
	800	2	S	Dial	150	2	D
	900	2	S		90	2	S
	1000	1	S		100	2	1
	1500	2	S		110	2	D
Dial	100	4	S		125	2	D
	125	4	2	Neonal	80	2	S
	140	4	3		90	2	S
Neonal	100	4	S		100	2	1
	130	4	2		110	2	1
	150	4	3		120	2	D
	160	4	D	Pentobarbital	40	2	S
Pentobarbital	200	2	S		50	2	S
	250	2	S		60	2	1
	275	2	S		70	2	1
	300	2	S		80	2	D
	350	2	S		90	2	D
	400	2	S	Phanodorn	120	2	S
	500	2	S		140	2	S
	600	2	S		150	2	S
Phanodorn	350	4	S		160	2	1
	400	4	S		170	2	1
	425	4	2		180	2	D
	450	4	2		190	2	D
	475	4	3				

S = All survived Figures are used for the number that died, the letter D signifies that all died 1 one died 2 two died, 3, three died

During the period of experimental work the rabbits were fed twice daily with a constant diet of alfalfa hay and rolled barley. The animals were fasted for a period of sixteen hours before administering the drug. All of the rabbits were well housed and bedded on dry straw.

The dose of the drug was calculated upon body-weight to within one mg. and placed in several small gelatin capsules. These capsules were given by moistening them with water, placing them far down in the rabbit's throat, and then washing them down with a small volume of water. The time was noted as soon as an oral dose had been given and the period before partial and complete anesthesia was measured. The period of anesthesia and the various symptoms were observed and recorded. The minimum lethal dose was judged when 50 per cent of the animals died within thirty hours or during unconsciousness.

In the foregoing table are recorded the results of administration of the compounds orally to rabbits in varying doses.

#### INTRAPERITONEAL INJECTION

The minimum lethal doses were determined by injecting carefully a freshly prepared solution of the drug into the peritoneal cavity of healthy rabbits. The solutions of the various compounds used were accurately prepared by dissolving a weighed sample of the product, furnished by the manufacturer, in a calculated amount of half-normal sodium hydroxide solution except in the case of barbital, pentobarbital and phenobarbital, where the sodium salt of the hypnotic was available. Amytal, dial, neonal and phanodorn were dissolved in half-normal sodium hydroxide; the amount of solution needed for 1 Gm. of drug being 8.84 cc. for amytal, 9.60 cc. for dial, 9.42 cc. for neonal and 8.46 cc. for phanodorn. The solutions were then made up to the required volume in a calibrated glass cylinder by adding sterilized distilled water. In every case the final solution contained 100 mg. per cc. of the hypnotic as the free acid. In the case of barbital, pentobarbital and phenobarbital, the compound as the sodium salt was weighed out and dissolved in sterilized distilled water in such concentration that the final solution contained 100 mg. per cc. of the hypnotic as the free acid. With amytal, dial and neonal, complete solution was never obtained in the alkali used. Since the residue in any instance did not amount to more than a milligram or two out of two Gm., it was ignored as negligible.

The minimum lethal dose again was taken as that amount which caused death in 50 per cent of the animals within thirty hours or during anesthesia.

#### COMMENT

The approximate minimum lethal doses are herewith summarized, together with those by Fitch and Tatum.

	Oral Administration		Intraperitoneal Injection	
	Present Report	Fitch and Tatum	Present Report	Fitch and Tatum
Barbital	385	275	375	225
Phenobarbital	140	150	150	150
Amytal	Above 1500	575	105	90
Dial	125		100	
Neonal	135	160	110	115
Pentobarbital	Above 600	80	175	65
Phanodorn	450	450	170	130

The most striking differences from the former results are noted with oral doses of amytal and pentobarbital which we found practically non-lethal up to the figures given. In addition the period before appearance of complete anesthesia was always more or less uncertain. These facts would be best explained by incomplete or very slow absorption and application in human cases might be very different.

Another interesting observation is that the drugs are divided distinctly into two groups according to the degree of toxicity by oral administration. Those with a low dose (below 150) are dial, neonal and phenobarbital, the others are above 375. The ratio is, thus, 375:150 or about 2.5:1.

Comparison of the times required to produce anesthesia also furnished some interesting observations. In the table below the values given are in minutes following administration and the exact attainment of anesthesia was determined by loss of the corneal reflex.

	Orally		Intraperitoneally	
	Limits	Usually	Limits	Usually
Barbital	60-180	90	45-180	60
Phenobarbital	90-180	120	30-180	90
Amytal	60-240	120	10-15	10
Dial	60-240	90	20-60	45
Neonal	90-300	120	10-30	20
Pentobarbital	120-240	120	10-15	10
Phanodorn	60-240	90	10-60	30

From a study of these values, one could safely conclude that amytal and pentobarbital act at about the same rate and in the same manner. Both are the most rapidly acting of the entire group when given intraperitoneally. Barbital and phenobarbital are characterized by having essentially the same speed of action either orally or by injection. Except for barbital and phenobarbital, they all act very rapidly when injected, causing almost immediate paralysis of the limbs and flaccidity of the abdominal muscles. The anesthetic action progresses until the animal is prostrated, with the eventual loss of the corneal reflex which has been taken as an indication of anesthesia. It should be noted here that, even with very large doses by mouth, amytal often paralyzed the animals for as long as thirty-six hours without giving loss of the corneal reflex.

The criticism might be made that, since hypnotics are being considered, the appearance of sleep should be a criterion of efficiency. However, it was found that there is no good method of determining when a rabbit has gone to sleep. The drug manifests itself by first causing paralysis of the hind legs with loss of motor reflex. This paralysis progresses to the front legs and last of all to the neck and head. At this last stage of narcosis the animal is prostrated. The next stage is loss of consciousness and the animal is apparently in a deep coma with abolition of all reflexes. It was, therefore, concluded that only the minimum anesthetic doses, if they could be accurately determined, would serve as a comparison for efficiency.

The duration of narcosis also gives interesting comparisons. In the table below, the time is given in hours.

	Orally		Intraperitoneally	
	Limits	Usually	Limits	Usually
Barbital	10-27	18	12-24	16
Phenobarbital	12-30	17	11-27	17
Amytal	4-24	16	3-18	4
Dial	8-24	16	4-16	15
Neonal	12-36	16	4-15	12
Pentobarbital	4-18	15	1-2	1 5
Phanodorn	2-19	12	0 75-2	1 5

It is plainly evident from these figures that the average duration is about the same for all of the drugs studied when given by mouth. However, it was noted that amytal, barbital and neonal in sub lethal doses sometimes produced narcosis lasting as long as thirty-six hours, with a subsequent general paralysis for as much

as ten hours Pentobarbital and phanodorn by injection are characterized by producing the shortest period noted, and recovery after administration with these two drugs is more rapid than with the others

It is thought that the period or duration of anesthesia is not a criterion of efficiency because sometimes the more rapidly acting drugs produce a deeper narcosis than the others In addition the anesthesia was marked by shallowness of respiration and greatly diminished heart beat, although the animal recovered very quickly nevertheless

A few other observations of interest are also herewith noted

Excessive diuresis and constant evacuation of the colon was observed after barbital

Two animals died two weeks after apparent recovery from dial Autopsy of the animal revealed nothing abnormal in the intestinal organs There was noticed a degeneration of the bones in the hind legs, which appeared as a rotting of the shaft and articulating surfaces This condition was observed only twice with dial and not at all with the other drugs, and probably had no relation to the hypnotic

Upon autopsy of animals that had died from lethal doses of neonal, there was observed a greatly distended bladder containing a large amount of white deposit Microscopical examination of the deposit revealed nothing but a few epithelial cells No barbiturate could be identified in the material, but an examination showed the presence of alkali phosphate It was concluded that the deposit was mainly this phosphate and of no pathological importance

By intraperitoneal injection of pentobarbital there was produced very deep anesthesia which lasted from one to two hours Recovery was very rapid

A short period of hyperexcitability just after injection of phanodorn was noted

Recovery from large doses of phenobarbital is comparatively slow Paralysis after anesthesia may persist in some cases for as long as twenty-four hours

#### SUMMARY

The toxicity in rabbits and the comparative efficiency were studied for amytal, barbital, dial, neonal, pentobarbital, phanodorn and phenobarbital, using both oral and intraperitoneal routes

Some of the figures for the minimum lethal dose differ markedly from those found in the literature

Apparently the general ratio of efficiency to toxicity is approximately the same for the seven compounds, except that amytal and pentobarbital seem to be extremely safe by oral administration.

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"A vigorous appeal to Japan, asking her to stamp out the wide-spread illicit opium traffic engaged in by her subjects, has been made in a resolution of the opium advisory committee of the League of Nations This action followed the assailing of Japan's laxity toward the bootleg narcotics traffic, made by spokesmen for China, England, Canada and the United States "

MONARDA PECTINATA, NUTT, A PHYTOCHEMICAL STUDY \*<sup>1</sup>

BY JOSEPH B. BURT

## I. THE HERB

## A. WEIGHT OF THE PARTS OF THE PLANT

About four and one-half pounds of the dried herb, which had been collected in Scottsbluff County, western Nebraska, and identified by Prof. J. E. Weaver, of the Department of Botany of the University of Nebraska, as *Monarda pectinata*, Nutt., were carefully separated into flowers, leaves, stems and roots. The weights of the air-dried materials are tabulated below. Inasmuch as most of the plants were devoid of roots, the percentages of the above ground components were recomputed because the results revealed a truer relationship.

Part	Weight	Total Weight	Percentage of Above Ground Portion
Flower	759 Gm	39.4	41.5
Leaf	498 Gm	25.8	27.3
Stem	569 Gm	29.5	31.2
Root	102 Gm	5.3	
	<hr/> 1928 Gm	<hr/> 100.0	<hr/> 100.0

## B. DETERMINATION OF MOISTURE

The water content of the air-dried materials was determined by means of the xylene method (1), duplicate determinations being made. The percentage results are tabulated below.

	A	B
Flower	8.0 per cent	8.0 per cent
Leaf	8.6 per cent	8.6 per cent
Stem	8.2 per cent	8.2 per cent
Root	6.5 per cent	6.5 per cent

## C. EXTRACTION WITH SELECTIVE SOLVENTS

For the sake of a general comparison with the extractives of the two species of *Monarda* previously examined, the several parts of the plant were exhausted with selective solvents according to the modified Rosenthaler method (2) as employed by Harwood (3) in his study of *Monarda fistulosa* L. A Soxhlet extractor was employed for the petroleum ether and ether extractions. For alcohol, hot extraction in a flask connected with a reflux condenser was used. The aqueous, alkaline and acid extractions were also hot. The alkali was 0.2 per cent potassium hydroxide and the acid 1.0 per cent hydrochloric acid. The differences in the weights of the fully extracted marc (with all six solvents) and the weights of ash are reported as crude fibre. No correction has been applied for the weight of alkali accumulated in the alkaline extractives, which causes this value to assume disproportionate percentages in some instances, especially in the extraction of the root. In this

\* Scientific Section A. Ph. A. Portland meeting, 1935.

<sup>1</sup> A portion of a thesis submitted to the Graduate School of the University of Wisconsin in partial fulfillment of the requirements for the degree of Doctor of Philosophy (Pharmacy as major).

case, on account of the hygroscopic effect of the alkali, it was found necessary to neutralize the alkali with dilute hydrochloric acid before the extracts could be brought to dryness. The solvents were used successively in the following order: petroleum ether, ether, hot alcohol, hot water, hot aqueous alkali and hot aqueous acid. The determinations were carried out in triplicate, but in order to conserve space and at the same time afford a more ready means of comparison, the averages of the three determinations only are reported for each of the four parts of the plant. The percentages of moisture in the air-dried materials are also included in the table which follows:

	Flower Per Cent	Leaf Per Cent	Stem Per Cent	Root Per Cent
Petroleum Ether	3.27	6.76	0.65	1.21
Ether	1.55	1.83	0.53	0.52
Alcohol	7.79	9.70	5.19	5.33
Water	17.62	19.78	11.75	11.24
Alkali	39.45	17.68	28.71	69.32
Acid	9.20	13.73	9.67	6.35
Crude Fibre	18.23	10.20	42.28	33.20
Ash	2.32	4.23	0.53	1.27
Moisture	8.00	8.60	8.20	6.50

An examination of this table leads to a few observations which are significant. The relatively small proportions of petroleum-ether and ether-soluble extractive in the stem and root as compared with those of the flower and leaf are especially striking. It was noted in the examination of the xylene used in the determinations of moisture, that those portions used upon the stem and root were free from carvacrol or thymol, as determined by the Flueckiger test, while the portions used upon the flower and leaf gave positive tests. Again, the relatively high values for crude fibre in the stem and root are also noted, as well as the correspondingly low values for ash in these portions of the plant. Variations in the alkali extractives are doubtless of less significance, for the reason that the proportion of alkaline solution required to exhaust the several parts of the plant is not in strict ratio to the weight of sample used, giving rise to a lack of uniformity in the results, due to the unequal accumulation of the alkali in the extracts.

#### D ASH DATA

1 *Flower*—The air-dried flowers yielded the following percentages of ash, in two determinations:

	A Per Cent	B Per Cent
Water soluble ash	4.41	4.59
Water-insoluble ash	8.47	8.65
Total ash	12.88	13.24

The water-insoluble ash resolved itself into:

	A Per Cent	B Per Cent
Acid soluble ash	4.90	4.80
Acid-insoluble ash	3.57	3.85

2 *Leaf*—Two determinations of the air-dried material yielded the following results:

	A Per Cent	B Per Cent
Water-soluble ash	3 76	3 94
Water-insoluble ash	11 53	11 49
Total ash	15 29	15 43

The water-insoluble ash was constituted as follows

	A Per Cent	B Per Cent
Acid soluble ash	6 27	5 90
Acid insoluble ash	5 26	5 59

3 *Stem*—Ash determinations of the air-dried material yielded the following results

	A Per Cent	B Per Cent
Water-soluble ash	4 33	4 54
Water-insoluble ash	3 43	3 48
Total ash	7 76	8 02

The water-insoluble ash gave the following results

	A Per Cent	B Per Cent
Acid soluble ash	2 85	2 91
Acid insoluble ash	0 58	0 57

4 *Root*—The air-dried material gave, for two samples, the following percentages

	A Per Cent	B Per Cent
Water soluble ash	2 14	2 08
Water insoluble ash	2 74	3 17
Total ash	4 88	5 25

The water-insoluble ash resolved itself into

	A Per Cent	B Per Cent
Acid soluble ash	1 79	2 01
Acid insoluble ash	0 95	1 16

For the purpose of comparison, the ash data given above are retabulated in the following, the averages of the two determinations being reported

	Per Cent in			Root
	Flower	Leaf	Stem	
Water soluble ash	4 50	3 85	4 43	2 11
Water insoluble ash	8 56	11 51	3 45	2 95
Total ash	13 06	15 36	7 88	5 06
Acid soluble ash	4 85	6 08	2 88	1 90
Acid insoluble ash	3 71	5 43	0 58	1 06

#### E INORGANIC CONSTITUENTS OF THE ASH

The methods followed in the analysis of the constituents of the ash were the same as those employed by Harwood (4) in his study of the inorganic constituents of *Monarda fistulosa*, L. The Cl, CO<sub>3</sub> and SO<sub>4</sub> radicals are reported for the water soluble ash, and Ca, Mg, Al, Fe and SiO<sub>3</sub> for the acid-insoluble ash

1 *Flower* —The following results were obtained from duplicate samples

	Per Cent	Per Cent
Ca	0 35	0 35
Mg	0 20	0 20
Fe	0 34	0 34
Al	1 15	1 13
Cl	0 31	0 29
CO <sub>2</sub>	3 21	3 21
SO <sub>4</sub>	0 64	0 59
SiO <sub>2</sub>	0 43	0 43
Undet	6 25	6 61

2 *Leaf* —The following ash constituents were determined

	Per Cent	Per Cent
Ca	0 29	0 36
Mg	0 19	0 20
Fe	0 27	0 27
Al	1 12	1 25
Cl	0 44	0 44
CO <sub>2</sub>	2 92	2 94
SO <sub>4</sub>	0 49	0 61
SiO <sub>2</sub>	0 62	0 65
Undet	8 95	8 71

3 *Stem* —The quantitative analysis of the ash yielded the following percentages, computed with reference to the air-dried material

	Per Cent.	Per Cent
Ca	0 93	0 96
Mg	0 08	0 07
Fe	0 07	0 08
Al	0 57	0 54
Cl	0 33	0 35
CO <sub>2</sub>	2 97	3 00
SO <sub>4</sub>	0 50	0 46
SiO <sub>2</sub>	0 10	0 10
Undet	2 20	2 46

4 *Root* —The following constituents were determined quantitatively, computed with reference to the air-dried material

	Per Cent	Per Cent
Ca	0 24	0 23
Mg	0 15	0 12
Fe	0 20	0 20
Al	0 37	0 37
Cl	0 07	0 07
CO <sub>2</sub>	1 82	1 82
SO <sub>4</sub>	0 11	0 10
SiO <sub>2</sub>	0 09	0 10
Undet	1 83	2 24

In the tabulation which follows, the percentages of elements and radicals were computed with reference to absolutely dry material, for any conclusions that may be drawn from these figures should be directly comparable and not subject to cor-



rection by the differences in the moisture contents of the several air-dried materials. The values recorded are the averages of the two determinations previously reported

	Flower	Leaf	Per Cent in Stem	Root
Ca	0 43	0 35	1 02	0 26
Mg	0 22	0 22	0 09	0 14
Fe	0 37	0 30	0 09	0 21
Al	1 24	1 29	0 60	0 40
Cl	0 33	0 48	0 37	0 07
CO <sub>2</sub>	3 49	3 20	3 25	1 95
SO <sub>4</sub>	0 66	0 60	0 52	0 12
SiO <sub>2</sub>	0 47	0 70	0 11	0 11
Undet	6 99	9 67	2 44	2 16

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## THE COMPARATIVE ANTISEPTIC ACTION OF OINTMENTS AND RELATED PRODUCTS \*

BY ARTHUR H BRYAN <sup>1</sup>

### INTRODUCTION

Using modified Reddish and U S P H "Cup and Smear" methods with clinical observations wherever practicable, an attempt was made to study the bactericidal activity of 80 well-known U S P, N F, N N R, proprietary ointments, face and dental creams

### METHOD

In the laboratory tests, blood serum heart infusion agar with human, sheep and bovine blood serum was used after sterilization through a Berkfeldt filter

The first bacterial test organism experimented with was a 24-hour old culture of *Staphylococcus aureus* incubated at 37° C, later pyogenic cocci obtained directly from acne and pimples pus was cultured

Intermittent sterilization of the culture media was carried out in an autoclave at 120° C for half an hour on two or three successive days in individual test-tubes containing 15 cc of heart infusion agar. After the agar was cooled to 45° C, the sterile blood was added together with one drop from a sterile hypodermic syringe containing a 24-hour old culture of the test organisms. The tubes were well shaken and quickly poured into previously sterilized, wrapped petri dishes

The varying consistency of the test ointments and other preparations used made them awkward to handle, especially in the small quantities necessary for the

\* Scientific Section A PH A Washington meeting 1934

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test, therefore, the ointments were heated slightly to semifluid state in order to get full surface contact with the agar. It is doubted whether or not this heating interfered with the antiseptic action of the ointment, because ointments that could be used unheated gave identical results with those slightly heated, and, as a further check, one batch of ointments was run unheated using the U S P H technique as a control. In the Reddish<sup>1</sup> cup method, reasonably equal amounts of ointment were used in the tests by knocking out the ends of glass Luer's syringes, drawing up a definite quantity of ointment and finally smoothing off the surface with a spatula. The outside of the syringe was slightly heated, so that the ointment would run sufficiently for it to be carefully directed and dropped into the cup.

In the "smear" method, previously calibrated 8-mm bore glass tubes were used as pipettes and plunged down into the test ointments up to a definite mark, and then slightly heated so that the ointments just ran out. The melted ointment was then directed to the center of the agar plate previously inoculated with the pus producing staphylococci. Simply smearing on the ointments with sterile glass stirring rods proved satisfactory provided quantitative tests were not needed.

Another scheme, giving uniform results, which tallied with the results obtained using the naked unheated ointments, consisted in putting all the ointments in separate test-tubes and numbering them consecutively. The test tubes containing the ointments were then heated in hot water at a temperature of not over 45° C according to the respective melting points of the bases, and shaken thoroughly. Then using an individual piece of 8-mm marked glass tubing for each test-tube, a definite quantity of the ointment was dropped into the cup or smeared over the surface of the agar as before. Heating greatly facilitated the quantitative handling of the majority of different preparations tested. It also brought the ointments to suitable consistency needed for the "cup" and "smear" methods. The cup method was best for lard base ointments and any other preparations that tend to soften at room temperature. The smear method was finally adopted for all other ointments. After the culture media hardened in the petri dishes, the cup was cut by pressing a test-tube down to the bottom of the media, and the center lifted out with a toothpick or spatula. The usual few drops of liquid culture media were dropped into the bottom of the cup so that diffusion could take place on the floor of the cup.

Sets of smear plates were run with ointment placed above and then below the agar with results fairly uniform in both cases. After a 24-hour period of incubation at 37° C and one batch at room temperature, the inhibition zones were measured, and the plates photographed or blue printed.

#### CLINICAL OBSERVATIONS

1 The characteristic lesions of follicular dog mange and ring worm responded to severeunctions of iodine and the stronger mercurial ointments, used in veterinary practice, but failed to respond when old ointments were used.

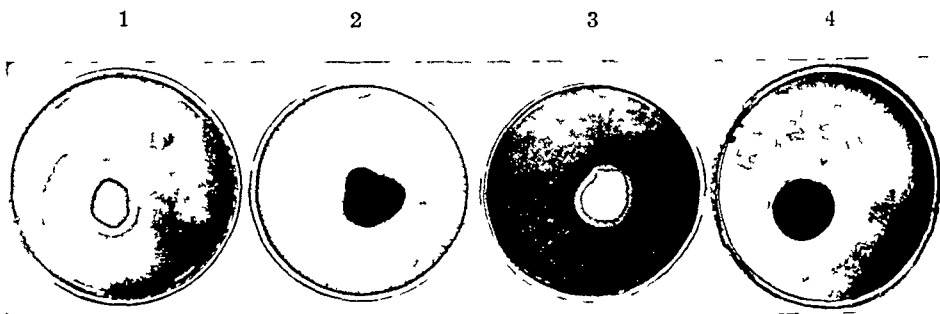
2 The erythematous, desquamative areas characteristic of Dhobie itch responded promptly tounctions of fresh 10% salicylic acid ointment, the lesions disappearing after a few daily treatments. The local action of the ointment is indi-

<sup>1</sup> Reddish, G F, *JOUR A PH A*, 16 502 (1927)

cated to the patient by a few minutes of intense smarting When old 10% salicylic acid ointment was used there was no smarting and the lesions did not disappear

#### SUGGESTED STANDARD FOR THE GERMICIDAL COEFFICIENT OF OINTMENTS

The phenol coefficient of liquid antiseptics is the standard for determining the germicidal activity of antiseptics and disinfectants It is suggested that a similar tentative germicidal coefficient standard be adapted for the testing of the antiseptic strength of ointments and related products The most satisfactory test for ointments is the Reddish U S Public Health Cup and Smear method, with the mercurial ointments giving the most uniform results



- 1 5% Salicylic acid ointment in Benzoinated lard with inhibition zone of 2.5 mm in a culture of *Staphylococcus aureus*
- 2 Zinc oxide ointment with no zone of inhibition suggesting absence of germicidal activity
- 3 10% Phenol ointment in petrolatum with an inhibition zone of 2.0 mm against pure cultures of combined *Staphylococcus aureus* and *albus*
- 4 Ammoniated mercurial ointment in lanolin base with 8 mm zones of inhibition and well marked diffusion The germicidal activity was well marked against pyogenic mixed infection bacteria taken from abscess pus

When running Reddish ointment or related products tests it would be well to include for comparative purposes either citrine or ammoniated mercurial ointment or both, for that matter Measure the width of the inhibition zones of the other products to be tested and make a comparative ratio with the above mercurial ointments On our tests, citrine and ammoniated mercurial ointments gave approximately 8-mm zones under varying test conditions, although the U S P H rated them lower In order to find the mercury ointment coefficient of any ointment or related product, it is only necessary to divide the test ointment inhibition zone by the mercurial ointment zone, which in this case was 8

Example Iodine Ointment gave an inhibition zone of 6.5 then  $6.5 \div 8 = 0.81$  which would be the mercury coefficient of the U S P Iodine Ointment

#### 40 MERCURY OINTMENT COEFFICIENTS

Citrine Ointment N F	1.2
Ammoniated Mercury Ointment U S P	1.0
Iodine Ointment U S P	0.81
Salicylic Acid Ointment Benzoinated Lard 10%	0.81
Phenol Benzoinated Lard 10%	0.81

Mercurochrome, Lanolin and Petrolatum, 2%	0 81
Yellow Oxide of Mercury Ointment, 5%	0 75
A Stainless Iodine Ointment (proprietary product)	0 75
Argyrol Ointment, 10%	0 75
Stronger Mercurial Ointment, U S P	0 7
Red Oxide of Mercury, N F	0 65
Mild Mercurial Ointment, U S P	0 6
A Dental Cream (proprietary product)	0 6
Salicylic Acid Ointment, Benzoinated Lard, 5%	0 55
A Dental Cream (proprietary product)	0 5
Phenol Ointment in Petrolatum, 10%	0 5
Phenol Ointment in 75% Petrolatum and 25% Anhydrous Lanolin, 5%	0 5
Tar Ointment	0 37
Calamine Ointment	0 37
Alcoholated Sulphur Ointment	0 37
Stimulating Ointment	0 34
Phenol Benzoinated Lard, 10%	0 32
Thymol Iodide Ointment	0 3
Tannic Acid, Belladonna, Camphor White Precipitate 3 yrs old	0 15
Yellow Oxide of Mercury Ophthalmic, 1%	0 15
Phenol in Petrolatum 5%	Zero
Phenol in Anhydrous Lanolin and 5% Yellow Wax	"
A Face Cream (proprietary product)	"
Zinc Oxide Ointment	"
Chrysarobin Ointment	"
Boric Acid Ointment, 10%	"
Acridavine, Lanolin Base, 1%	"
Sulphur Ointment	"
Compound Resorcin	"
Methylene Blue, Lanolin 2%	"
Gentian Violet, Lanolin, 2%	"
Ichthyol Ointment	"
Iodoform Ointment	"
Boric Acid, Petrolatum and Lanolin, 5%	"
Precipitated Sulphur Ointment	"

This substantiates the work of Husa showing that the incorporation of yellow wax reduces the antiseptic properties of phenol ointments to zero

#### CONCLUSIONS DRAWN FROM LABORATORY OBSERVATIONS

1 Lanolin and Benzoinated Lard appeared to be the most satisfactory bases for maximum antiseptic and diffusion activity

2 U S P and N F ointments showed no antiseptic action in strengths of 0.05% to 1% as indicated by the absence of inhibition zones except ophthalmic yellow oxide of mercury ointment, which gave a uniformly good zone of inhibition

3 The recently prepared U S P and N F ointments, in which the active ingredient content was 5% and 10% that were tested showed antiseptic action as shown by well defined inhibition zones except 5% phenol in petrolatum Phenol in a mixture of lanolin and petrolatum, according to Professor Husa's formula, gave good inhibition zones Five per cent ointments gave 3-4-mm zones, and 10% showed 7-8 mm, including twice the antiseptic strength

4 Tar ointment, all the mercurials, including mercurochrome argyrol, gentian violet, salicylic acid, iodine showed consistent antiseptic action with well defined zones of inhibition under all test conditions

5 The largest and most consistent inhibition zones were formed with the various iodine and mercurial ointments, two per cent mercurochrome and 2% mercuric iodide ointments showing the widest areas of diffusion and inhibition

6 Mercurial ointments did not deteriorate over a period of ten years, all showing standard inhibition zones comparable to fresh ointments. The other ointments apparently showed decreased antiseptic activity with lessened or no inhibition zone on standing.

7 The rate and extent of diffusion was evidently influenced by such physical characteristics of the base as melting point, surface tension, permeability, cohesion and adhesion, etc., as indicated by varied zones obtained with the same medicaments in different bases and under altered laboratory conditions.

8 U S P, N F and proprietary iodine, phenol and salicylic acid ointments gradually lost their antiseptic action within 3-9 months, the iodine in petrolatum base showed least deterioration. U S P iodine ointment on March 1934 gave a 6.5 mm inhibition zone and on November 1933, the inhibition zone was only 1.4 mm. Thus four months' standing evidently decreased the antiseptic activity of the ointment.

9 Ointments, such as boric acid 10%, acriflavine, methylene blue, ichthol, zinc oxide, compound resorcinol, chrysarobin, sulphur, etc., showed no inhibition action on staphylococci, mixed pyogenic cocci or subtilis cultures. Zinc oxide showed a very faint indefinite linear zone around the ointment periphery.

10 In contrast to the comparative bactericidal inertness of sulphur ointment, the isolated sulphur ointment and sulphur iodide ointment showed antiseptic action depending upon the base and the amount of alcohol or iodine incorporated therein.

11 The mercurial ointments, irrespective of whether half or full strength, showed practically equal widths of the inhibition zones. However, the diffusibility of both tends to be the same, therefore this result does not necessarily mean equal antiseptic activity.

12 Inhibition zones were wider on staphylococci and streptococci than subtilis cultures. Other spore bearing air flora grew outside but not within the inhibition zones.

13 The most uniform results were obtained when the ointments were freshly prepared and smeared on either unheated or slightly heated. Overheating gave confused and even negative results in some instances, probably due to chemical action resulting in stearification, with the fatty esters inactivating the preparations.

14 The diffusion and inhibition zones on the plates remained after several months' standing. Some old plates with good inhibition zones were purposely exposed to air bacterial flora. There was no growth within the inhibition zone, showing that the antiseptic action was still there.

15 Most commercial face creams showed no bactericidal activity with absence of inhibition zones on plate cultures of pimple and acne pus bacteria.

16 Of well known dental creams only two showed marked inhibition zones indicative of antiseptic activity.

17 The iodine, phenol, argyrol and salicylic acid ointments showed the greatest tendency to deteriorate as evidenced by decreased or lost inhibitory powers.

18 In general epidermatic ointments appeared to show less activity than endermatic or diadermatic ointments. This hypothesis is exemplified by the phenol and salicylic acid in petrolatum results.

19 The Reddish Cup and Smear method proved useful for testing the comparative antiseptic strength of ointments, face creams, salves and also dentifrices.

#### SUMMARY

This study indicated the necessity for preparing and dispensing fresh ointments because, aside from the mercurial ointments, all others tend to undergo deterioration on standing.

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*The Australasian Journal of Pharmacy* quotes

The United States Federal Trade Commission is objecting to the use of the words 'laboratory' or 'laboratories' in the name of an organization unless the firm does actually maintain laboratories for the purpose of manufacturing or compounding the preparations that it distributes. The Commission is of the opinion that such representations constitute an unfair trade practice and manufacturers are being asked to desist from using this title unless they are in a position to comply with the requirements laid down by the department."

# FURTHER PIGEON BIOASSAYS AND DIURETIC TESTS OF DIGITALOIDS \*

BY A J LEHMAN <sup>1</sup>

Pigeon assays of a number of the more important and acceptable digitalis specialties were reported in a previous paper (1) The introduction of some new products and of a diuretic test (2) since that time made it desirable to bring assays and comparisons with the pigeon method up-to-date, hence, the present report

## METHOD AND PRODUCTS USED

The pigeon assay for emetic doses was carried out according to the original description of the method (3), the number of pigeons varying according to requirements The number ranged from 18 to 73, average, 38 birds for each assay Intravenous fatal doses were determined in the same pigeons used for emetic doses, after a period of recovery Selection of pigeons for elimination of a conditioned vomiting reflex was not practiced as it was unnecessary Such selection has been practiced by Lieb and Mulinos (4), and a slow intravenous injection, as in the cat method, by Haag and Woodley (5), with results which confirm the value of the pigeon method for bioassay of digitalis The great advantages of the pigeon emetic method have been summarized as follows by Hanzlik (6) who introduced the method simplicity, reasonable accuracy and economy, pigeons are easily available everywhere at any time, no surgical anesthesia or operation is necessary, a result is obtained in 15 minutes, pigeons can be used repeatedly, fatal dose can be obtained in the same pigeon after the emetic dose, results compare favorably with the cat method, the probable full therapeutic dose can be estimated from the pigeon emetic dose The emetic and fatal doses of, and other doses for comparison with, the products tested in this study are presented in Table I

A total of 5 digitaloid principles and 1 purified (fat free) tincture of digitalis were assayed The purified principles were verodigen, glucosides of *Digitalis lanata* digoxin (also from *D lanata*), urginin and thevetin These were used in solutions as supplied by the manufacturers, verodigen being prepared as a 1 1000 solution Digiglusin, which is claimed to be a fat-free tincture of digitalis, was used in dilution according to the pigeon method None of the products is described in N N R, but urginin is a Council accepted product The doses used in this paper indicate mg or cc of product for each Kg body weight of pigeon

TABLE I—COMPARATIVE DOSES OF DIGITALOIDS \*

Digitaloid	Pigeon		Ratio		Predicted Total Chn cal Dose	Full Therapeutic Dose Claimed	Cat		
	M Em D	M F D	M Em D	M F D			M	F	D
Digitalis lanata	0 05 mg	0 3 mg	6 0	3 0 mg	1 75 mg (19)		0 34 mg	(16)	
Urginin	0 10 mg	0 45 mg	4 5	6 0 mg	3 to 9 mg (18)		0 2 mg	(18)	
Digoxin	0 12 mg	0 35 mg	2 9	7 2 mg	3 0 mg		0 44 mg	(15)	
Thevetin	0 31 mg	1 4 mg	4 5	18 6 mg	8 5 to 25 5 mg (14)		0 85 mg	(13)	
Verodigen	0 37 mg	1 0 mg	2 7	22 4 mg	6 5 mg (17)		0 65 mg	(17)	
Digiglusin	0 25 cc	1 1 cc	4 4	15 0 cc					

\* M Em D = minimum emetic dose, M F D = minimum fatal dose, mg = milligram, cc = cubic centimeter, digits in parenthesis indicate references to papers listed at the end of the paper

## EMETIC AND FATAL DOSES

All of the digitaloids used caused emesis Table I shows that doses for emesis varied considerably The *Digitalis lanata* glucosides had the lowest emetic dose or 0 05 mg and verodigen

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the highest or 0.37 mg. The doses of the other products fell in between these two and were actually as follows: thevetin, 0.31 mg.; digiglusin, 0.25 cc.; digoxin, 0.12 mg. and urginin, 0.1 mg.

From these results it would appear that verodigen might be preferable for therapeutic use owing to the comparatively larger dose required to provoke emesis. However, this would not follow, since the fatal dose of verodigen was relatively low, although second highest. This indicates that its emetic and cardiac actions are relatively weak, and the margin of safety in therapeutic usage, as judged by the lowest emetic-fatal dose ratio, rather narrow. The *Digitalis lanata* glucosides, claimed to be a pure, natural mixture of digitanin A, B and C, would be the safest according to the same criteria, since the emetic dose was only one sixth the fatal dose, although they were more efficient than verodigen according to both the emetic and fatal doses. Although the emetic and fatal doses of digoxin, which is a glucoside of *D. lanata*, urginin and thevetin varied among themselves, the ratios of these doses were practically the same, namely, 4.4 to 4.5, which was next to the highest ratio, or 6, for *Digitalis lanata* glucosides. These high ratios compare favorably with those of good strong leaves of *Digitalis purpurea* (3) and indicate satisfactory safety margins in therapeutic use.

The cause of the widely differing ratios of emetic and fatal doses for weak and strong products of digitalis is not known. One possibility, namely, impurities, may be ruled out, since the relation apparently holds with pure glucosides as well as with specially prepared products, and the ordinary official tinctures of digitalis. The contrasting tendencies in killing powers of the digitalis glucosides should not be overlooked, for dangerous symptoms may not be suspected from the relatively minor toxic effects such as nausea or emesis. The latter should be a sign for stoppage of the medication, keeping in mind that with some digitaloids the fatal dose may not be far away, such as those with a low emetic-fatal dose ratio.

#### COMPARATIVE FATAL DOSES

Some comparisons were made with intravenous fatal doses in pigeons and cats the latter being obtained from reports in the literature. Table I shows that the fatal doses in pigeons and cats were close for digoxin only. The fatal doses of the following were decidedly higher in pigeons: Verodigen, about 20 per cent, thevetin, about 70 per cent, and urginin, over 50 per cent. Accordingly, cats would appear to be more sensitive than pigeons, but it must be remembered that the procedures of administration are not always identical, especially the rate of injection and spacing of doses. The cat and pigeon fatal doses in this report are not as comparable as those for *Digitalis purpurea* in a previous report (3).

The symptoms of poisoning from the digitaloids were indistinguishable from those from digitalis specialties or tincture of digitalis. While the potency and fatal doses varied considerably, the killing power of the weaker products was, in general, out of proportion to the emetic efficiency, confirming previous results with ordinary digitalis (3). Consequently, these digitaloids have no special advantage over the ordinary official preparations except for the injection feature which may be useful in special cases.

#### COMPARATIVE CLINICAL DOSES

As for use of the pigeon emetic dose for predicting the probable full therapeutic or clinical dose, Stockton (7) has shown by clinical tests that this is practically feasible.

sible for digitalis Guidi (8), Starnotti (9), Carratala (10) and Redonnet (11), who have made similar comparisons, practically agree with Stockton's experience, except for interpretation of minor details Dock, Stockton and Lehman (12) have made comparisons with results of other methods and confirm the close parallel of pigeon emetic and clinical effects No clinical comparisons of the digitaloids of this report have been made in this institution, but the full therapeutic doses claimed for them in the literature are presented in Table I These may be compared with the clinical doses predicted from the pigeon emetic doses for a 60-Kg man, using the product according to the Eggleston method of medication The doses claimed in the literature may not have been determined according to the latter method It is seen that only the predicted and claimed clinical doses for urginin and thevetin might agree, provided averages of the claimed dose-ranges be used Digoxin, according to pigeon estimates, would permit a clinical dose over two times that claimed, *Digitalis lanata* glucosides, not quite two times and verodigen, over three times Further discussion is hardly worth while, since the methods and conditions of administration may not be exactly comparable

#### EFFECTS ON URINE FLOW

Defandorf (2) has recently described a diuretic (oliguric) test on the cat for bioassay of digitalis It appeared interesting to make some comparisons with effects on urine flow in pigeons Three different types of products were tested namely, a tincture of digitalis prepared according to the official method, digitan tincture (Merck) and digoxin The emetic doses of these products were determined previously, and then their effects observed on urine flow following repeated intravenous injections of one-quarter the emetic dose every five minutes until death

The pigeons were anesthetized with pentobarbital using 25 mg per Kg intramuscularly Blood pressure records were obtained from the carotid artery in the usual manner Both ureters were catheterized with slender glass cannulas and joined by means of a Y tube so that urine flow from both kidneys was obtained simultaneously Diuresis was encouraged by administering 20 cc of 0.9 per cent sodium chloride solution by vein and

when the flow of urine became constant a control flow was taken for 5 minutes The digitalis solution was then administered so diluted with physiological salt solution that 1 cc contained 1 M Em D Urine flow was measured constantly throughout each experiment The average results from 2 pigeons each for the 3 products tested are presented in Fig 1

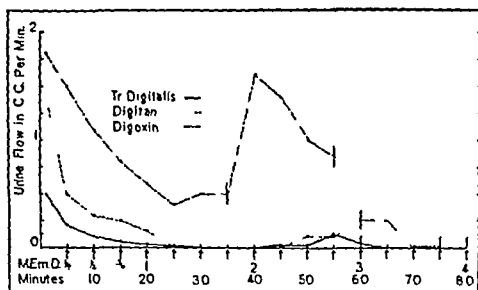


Fig 1—Effects of digitalis, digitan and digoxin on the urine flow in pigeons M Em D = minimum emetic dose, each arrow indicating an additional one quarter the emetic dose A short vertical line on a curve indicates death of a pigeon

It is seen that the first dose of each product caused an immediate decrease in urine output This decrease became more marked with each succeeding dose until one and one-quarter emetic doses were reached when the urine flow ceased altogether, or dropped to its lowest point, depending on the initial magnitude of diuresis When a total dose of one and three-quarters emetic doses was reached with digoxin, and two and one-quarter doses with digitalis and digitan, the urinary output suddenly increased for the next few doses and then gradually declined as death ap-



proached That this sudden increase in urine output was not due to the fluid injected was demonstrated by negative effects in one pigeon each, on digitan and digitalis, from injections of 10 cc per Kg of 0.9 per cent sodium chloride solution during the period of anuria

There was no correlation between the blood pressure and the urine flow The first emetic dose generally produced a small rise in blood pressure followed by recovery, and thereafter there were slight fluctuations either above or below the control level During the period of anuria the blood pressure was above the control level in one-half the pigeons At no time were the changes significant, and sudden collapse to the zero level occurred only when the full fatal dose was reached Obviously the effects on urine flow could not be attributed to a failing circulation, but they were probably the result of a marked renal vasoconstriction Such results would be expected in normal individuals

However, in cats, Defendorf reported a marked diuresis after the first dose of digitalis, followed by a decrease, and, as the injection of digitalis was continued, a further reduction to the control or initial flow Almost all this is in direct contrast to the results on pigeons, which followed closely the anuric effects, if any, in normal human subjects, rabbits or other animals As is well known, increases in urine output of human subjects occur only in edema and anasarca Therefore, cats respond abnormally Or, the variability is so great in these animals that results on urine output are not noteworthy unless a large number of cats is used, which is generally prohibitive This appears to be another instance of the unreliability of digitalis responses of cats

On the other hand, the effects on urine flow of the digitalis products tested on pigeons were quite consistent among themselves, and with expectations Repeated small doses produced a gradual decrease in urinary output which reached its lowest level at a little above the full emetic dose If such a marked anuric effect were to be chosen as the end-point, it follows that the urinary reaction would be no more sensitive than the emetic end-point, which is distinct and definite Moreover, the ease and simplicity of carrying out a bioassay according to the pigeon emesis method completely outweighs the more difficult and complicated procedure necessary for accurate determination of urine output The urine method has nothing to offer as a bioassay method for digitalis, although it might be useful in pigeons for comparing the renal vasoconstrictor efficiency of different products

#### CONCLUSIONS

- 1 The following 6 new digitaloids were bioassayed by the pigeon method for emetic and fatal doses, and comparisons made with the cat fatal, and full therapeutic doses reported in the literature *Digitalis lanata*, urginin, digoxin, thevetin, verodigen and diglugin

- 2 Digitalis, digitan and digoxin were found to produce anuric effects in pigeons, in agreement with similar known effects of digitalis in normal human subjects and some other mammals, but in contrast to a diuretic effect claimed for cats, which respond either abnormally or too variably

- 3 Urine flow as an end-point for estimating the potency of digitalis products has nothing to offer as a bioassay method, being too variable and unnecessarily complex and difficult, as compared with the easier and simpler pigeon emesis (alone)

or combined with fatal dose) method whose value and applications have been sufficiently established

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## A STUDY OF THE TOXICITY AND ANTIPYRETIC ACTION OF D GLUCONO-PARA-PHENETIDIN \*

BY HERBERT A BRAUN AND GEORGE F CARTLAND <sup>1</sup>

Within the last decade a number of synthetic modifications of acetphenetidin and acetanilide have been studied in an attempt to increase the antipyretic and analgesic action of these compounds or to reduce their toxicity

Hambourger<sup>2</sup> has reported pharmacological studies on the gluconic acid derivative of para-phenetidin  $C_6H_{11}O_6NHC_6H_4OC_2H_5$ . He finds that this compound has a very low toxicity as compared to acetphenetidin when administered orally to rats. He states that, as an antipyretic, it is about as effective as acetphenetidin when administered in equimolecular portions to rabbits which had been fevered with hay infusion

We have completed a study of glucono-para-phenetidin in which we have confirmed the findings of Hambourger regarding the relatively low toxicity of this compound as compared to acetphenetidin. However, in contrast to Hambourger's report, we found that glucono-phenetidin exerts a much lower antipyretic action in fevered rabbits than that produced by equimolecular quantities of acetphenetidin

### ACUTE TOXICITY

Glucono-phenetidin was administered as a suspension in 5% acacia to albino rats by means of a stomach tube. Since the quantity of this drug was too great to be administered in one dose, three divided doses were given over a period of three

\* <sup>1</sup> From the Laboratories The Upjohn Company, Kalamazoo, Michigan

\* Hambourger, W E, *Proc Soc Exptl Biol Med*, 31, 365-367 (1933)

hours The minimum lethal dose (M L D), or the dose which killed more than 50% of the rats, was found to be greater than 50 Gm per Kg of rat

Parallel experiments were conducted to determine the acute toxicity of acetphenetidin The results given in the table indicate that the M L D for this drug is 2 Gm per Kg of rat The maximum tolerated dose (M T D), or the dose at which toxic symptoms appear, was found to be 0.75 Gm per Kg Toxic symptoms observed were cyanosis, slow respiration, depression, loss of equilibrium, coma and finally death

TABLE I — COMPARATIVE TOXICITY OF GLUCONO PHENETIDINE AND ACETPHENETIDIN

Glucono phenetidin			Acetphenetidin		
Dose per Kg /Gm	No. of Animals Used	% Mortality	Dose per Kg /Gm	No. of Animals Used	% Mortality
20	5	0 0	0.75	2	0 0
30	5	0 0	1	4	0 0
50	5	0 0	2	10	60
			3	10	90
			4	5	100
			5	2	100

By means of spectroscopic examination of the blood of depressed rats, methemoglobin formation could be detected when doses of 1 Gm per Kg of acetphenetidin were administered At no dose of glucono-phenetidin could the presence of appreciable amounts of methemoglobin be determined, indicating that it is quite resistant to destruction in the intestinal tract which accounts for the greatly decreased therapeutic activity of the substance

#### ANTIPYRETIC ACTION

Rabbits were used as experimental animals They were starved for forty eight hours and were given no water for twenty-four hours At the end of this time, the animals were febrile by injecting 10% hay infusion which had been incubated at 37° C for twenty-four hours Five cubic centimeters of this infusion per Kg of rabbit were injected subcutaneously Normal rectal temperatures were taken at the beginning of the experiment Two hours were allowed to elapse after the injection of the hay infusion before a second reading was taken Increases in temperature varying from 0.5°–2° C over the normal were attained When the fever temperature was reached at the end of the two hours, the drugs suspended in a 1% acacia solution were administered to the rabbits by means of a stomach tube Rectal temperatures were taken at hourly intervals during the course of the experiment

In the majority of the experiments, ten rabbits were used for each trial From one to three trials were attempted for each dose Of the ten rabbits used two served as room temperature controls, two as fever controls, three were given acetphenetidin and three glucono-phenetidin Six doses of the drug were administered The doses of the first three trials were calculated on the basis of molecular weight, the ratio of glucono phenetidin to acetphenetidin being 7.4 In the last three trials, 0.75 Gm per Kg, the dose which was found to give an optimum depression of the temperature for acetphenetidin was compared with multiples of the equimolecular dosage (1.31 Gm) of glucono phenetidin

(1) 0.50 Gm /Kg	of acetphenetidin	to 0.87 Gm /Kg	of glucono phenetidin
(2) 0.60 "	"	1.05	"
(3) 0.75 "	"	1.31	"
(4) 0.75 "	"	2.62	"
(5) 0.75 "	"	5.24	"
(6) 0.75 "	"	10.50	"

In the first three trials where molecular equivalents of glucono-phenetidin were compared with acetphenetidin administered at 0.50, 0.60 and 0.75 Gm per Kg, the acetphenetidin was much superior to glucono-phenetidin in causing a depression of the temperature in fevered rabbits. The dosage of 0.75 Gm of acetphenetidin per Kg produced an optimum depression of temperature and consequently was chosen as a basis of comparison for higher doses of glucono-phenetidin which were 2, 4 and 8 times the equimolecular dosage. In each case, the antipyretic effect of glucono-phenetidin was less than that of acetphenetidin. In Chart I, the temperature curves of fevered rabbits treated with acetphenetidin 0.75 Gm /Kg and glucono-phenetidin 10.5 Gm /Kg are compared with the untreated controls. Each curve represents the average values obtained with five rabbits. Acetphenetidin caused a greater depression of temperature which lasted for more than five hours while the temperature of the fevered rabbits receiving glucono-phenetidin was above normal after two hours.

#### CONCLUSIONS

(1) A study of the toxicity and antipyretic action of glucono-phenetidin and acetphenetidin has been completed and is described.

(2) Toxicity. Glucono-phenetidin was found to be non-toxic in doses of 50 Gm /Kg in the rat confirming previous results. The M L D of acetphenetidin was found to be 2 Gm /Kg of rat which means that glucono-phenetidin is twenty-five times less toxic than acetphenetidin in the rat. The M T D for acetphenetidin is 0.75 Gm /Kg of rat.

Methemoglobin formation was not observed with glucono-phenetidin but was noted with 1 Gm /Kg of acetphenetidin.

(3) Antipyretic Action. Acetphenetidin and glucono-phenetidin were not found to be approximately equal when administered on the basis of their molecular weights using the 4.7 ratio. When the dosage of glucono-phenetidin was increased,

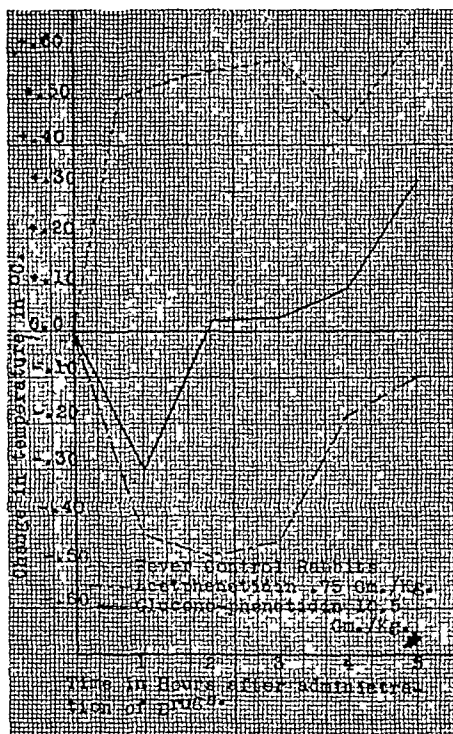


Chart I

to eight times that required by this ratio, its antipyretic effect was still less than that produced by acetphenetidin

The above findings conform with previous conceptions of investigators in the field of antipyretics, namely, that the toxicity and therapeutic activity of antipyretics decrease with an increase in the size of the substituted radical. The most effective compounds have the ethyl or acetyl grouping

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(A Paper of Scientific Section—"A Chemical Study of the Fixed Oil of Poke Root"—Page 636)

## DRUG STANDARDIZATION \*

BY E R SERLES <sup>1</sup>

It is a far cry from our modern conception of rational therapy to the time when the medical code of Hammurabi prescribed that the suffering Babylonians should treat their ills by charm, employing precious stones, frankincense or, what was even worse, the oral administration of lizard's blood, swine's teeth, moisture from pigs' ears, excreta of human beings, animals and even flies

Yet the toad skin which was used in those days without the slightest inkling of its real merit is to-day known to contain substances which act much like digitalis. Trendelenburg in 1909 isolated toxic principles from the skin of the common toad (Bufanin and Bufotalin) which produced the typical therapeutic effects of digitalis

Ma Huang, the Chinese plant Ephedra, has been known in Chinese medicine for more than 3000 years, but it remained for Chen and his co-workers to show us its relationship to adrenalin and its superiority to the latter in certain instances

Bones may not have been judiciously administered during the age of Ptolemy, lizard's blood would hardly be classed as appetizing, yet it is a significant fact that some of our great packing plants can afford to sacrifice the carcasses of their daily slaughter at extremely low figures because of the profits taken from the sale of glandular extracts and preparations made therefrom

How glibly we jest about the food we eat, asking ourselves about the vitamins it should yield. We may or may not take much stock in the claims made that certain drugs and food products are essential to growth and health and thereby eliminate disease, yet the pharmacist who still urges his customer to try a bottle of some standard blood purifier or the physician who still prescribes strychnine as a heart stimulant is only a shade ahead of the pharmacist who prepared a prescription for Schesch (a queen of the third Egyptian dynasty) which contained equal parts of the heel of an Abyssinian greyhound, of date blossoms and of asses' hoofs boiled in oil, recommending the same for a hair restorer

The early history of the practice of the "Healing Art" is filled with countless instances of confusion, quackery and jealousy. For hundreds of years suffering humanity was the victim of the charlatan, the knave and superstition

Gradually the more learned men of science began to break down the severe censorship of church and state and the chaos of knowledge concerning diseases and their treatment took on a more rational aspect

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This was especially true concerning the selection of drug substances used as remedial agents. The first record of a systematic effort to standardize drugs is found in the writings of Giacomo di'Dondi (1298-1359) who in the latter part of the thirteenth century wrote and secured publication of a treatise on "medicinal plants and simples" known as "Aggregator de Medicinis Simplicibus."

In 1473 the first medical dictionary, "Synonyma Medicinæ" was published at Strassburg. The volume contained definitions of drugs and simples known to the Greek, Latin and Arabic civilizations and was the work of Simone de Cordo who died more than a hundred years before the book was published.

These early works undoubtedly stimulated a more scientific trend of thought toward the use of drugs in the treatment of disease, but it can scarcely be claimed that they did more than to classify a substance as to its source and physical appearance.

To Valerius Cordus, therefore, must go the credit for the compilation and publication of our first Pharmacopœia in the year 1546. The subject matter therein contained was only a review of pharmaceutical formulas considered by Cordus to have unusual merit, yet it was of sufficient import to receive the approval of the Roman Senate, and the local committee of physicians to whom it was referred for examination. The committee reported that in their opinion it was the most complete and accurate treatise of its kind and ordered its publication without revision.

The Senate further ordered that physicians and pharmacists make use of the formulas compiled by Cordus in their respective practice, thus originated the first attempt at drug standardization. The text went through five revisions before 1666 and so great was the demand for the copies that it was published in Paris, Venice, Lyons and Antwerp.

Many works of a similar character were published in other countries and it is interesting to note their effect upon drug cultivation. Drug gardens sprang up almost over night as the artisan sought to supply the demand for the highly recommended medicinal substances. The first garden of this kind was established in Padua, Italy, in 1533.

The first legally controlled formula of all time was established under the British Law in 1673. It was known as "Goddard's Drops" and was purported to be a therapeutic agent of almost divine virtue. It was held to be of such great value as a remedy that Charles II is said to have purchased the right of patent from Dr. Goddard for \$25,000.00. Actually the preparation seems to have been only the distillate of human bones diluted with Spirit of Nitre or Spirit of Wine.

This form of drug standardization is still with us to-day and I am sorry to say that the physicians have for the most part continued the practice by seeking "letters patent" upon their favorite prescriptions.

I have no quarrel with the manufacturer or professional man of whatever calling who seeks to protect his property rights in the sale and distribution of a remedial agent which is the result of conscientious scientific endeavor and which through unscrupulous manipulation might fail of its therapeutic value, but I do condemn the system which permits the modification of well-established formulas of known value in order that their producer may write thereon a "new name" and ascribe thereto unreasonable therapeutic values.

Our own Pharmacopœia came into being in January 1817, through the efforts

of Dr Lyman Spalding when he placed before the Medical Society of the County of New York a project for the formation of a National Pharmacopœia. You are all more or less familiar with the history that surrounded this important event but I doubt if there are many present here to-day who have much of an idea as to how the eleventh revision of this drug standard has been effected.

The first edition of the U S P, of which I have a page proof copy, was no very great scientific contribution to the advancement of medical or pharmaceutical knowledge.

The eleventh revision, however, represents the acme of scientific knowledge gathered from the fields of biology, chemistry, physics, medicine and all of the allied branches of applied science throughout the civilized world.

Every remedial agent or substance used in the manufacture of a medicinal preparation which conforms to a U S P title is subjected to rigid standardization. Even water which may be used to prepare a crude drug for further extraction and which is no part of the finished product must contain not more than 0.001 Gm. per 100 cc. of dissolved solid matter.

Every chemical, solution, biological product or diluent must contain the lowest possible amount of inert material and every precaution is taken to guard against deterioration of the finished product.

Many of you may feel that drug standardization is of concern to the pharmacist only, but I assure you it is not. Take, for example, the standardization of Insulin. Before the pancreas gland leaves the slaughtered animal a veterinarian has carefully inspected the carcass, then comes the careful storage, the crude extractions, the countless number of operations it passes through before it is ready to be tested under the supervision of pharmacists and physicians. It is finally ready for the market, but it must still be properly stored lest it become inactive.

Next comes the patient and though it may be clinically evident that he is a diabetic no Insulin should be administered until we know the various blood sugar levels and his carbohydrate tolerance, all of which require the knowledge of a physician and a nurse or laboratory technician. He may even require a dental service, but more important than all of these he will require a daily dosage of an accurately standardized Insulin.

Thus we see that a single patient has, whether we acknowledged it or not, made us professionally interdependent.

Many similar instances might be cited wherein the preparation, standardization and use of a drug require the whole-hearted cooperation of the manufacturer, the physiologist, the chemist, the pharmacologist and the members of every profession here represented, yet there still remain certain practices in medical therapy and drug standardization which are a trial to all of us.

Take, for example, the case of digitalis—when Sir William Withering first gave to the world his knowledge of the therapeutic value of the old time infusion he little dreamed that he would begin a controversy which should last for generations, a controversy which promises to last through generations yet to come.

There are in the United States to day more than seventeen manufacturers of digitalis preparations each claiming for his special product a certain superiority of therapeutic achievement not common to any other digitalis preparation heretofore produced. True, the drug is and has been officially described in every Pharma

copœia published for many years. Its therapeutic value has been clearly established by the best means known to science. Its clinical usage is understood by every physician but we are still willing to kid ourselves into thinking we love our wives and sweethearts the more whenever they have a new dress. What I am trying to say is this: Why should we make room for a new medicinal preparation which professedly admits by its own label that it is equal to a certain number of units of strength as prescribed by the U S P if you will but increase or decrease the dosage as suggested by the manufacturer? Why should we crowd the pharmacists' shelves with just one more bottle of a drug which he already has in stock, thus increasing his inventory and the cost to the patient? What special advantage is there in having seventeen different kinds of digitals preparations all adjusted to the same standard, the administration of which results in approximately the same therapeutic effect?

The chaos in connection with the instance cited is equally true with aspirin, cod liver oil, liver extracts and many other remedial agents now found in the U S P.

An even greater sacrilege of scientific knowledge is made by those who combine a few standard U S P drugs, add a flavor or some inert substance and christen the newborn creation with a "gold medal" name. Then they detail the physician or dentist, who in turn hands the new wonder to his patient. When sufficient publicity has been established, the radio advertising begins and in a short time every cross-road merchant has the product for sale.

I need not recite to you the evils of this practice. You know them too well.

In the last quarter of a century we have come far from that time when a knowledge of the "Healing Art" was based upon chicanery, or magic. We have progressed far in the removal of the enigma of professional jealousy which here is evidenced by what I believe is the first time such a convention as this has been held within the confines of the United States, yet I adjure you not to be swallowed up in the complacent satisfaction of a good beginning.

Each succeeding step in scientific progress has been marked by untold labor. There is no place in the Interprofessional program for those who assume the lag-gard's part or jeer at others' faltering steps.

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## THE ANTISEPTIC ACTION OF MOUTH WASHES AND TOOTH-PASTES IN VIVO \*

BY ARTHUR H. BRYAN <sup>1</sup>

Previous attempts to evaluate antiseptics have been largely based on *in vitro* germicidal coefficient determinations, the data coming from the power to kill living bacteria grown in artificial media. The present experiments contemplate a series of *in vivo* observations in an effort to evaluate the effectiveness of mouth washes, tooth-pastes and tobacco smoke, in inhibiting the growth of nasal and mouth flora of pathogenic microorganisms directly in the mouth. The mouth washings of several hundred students were examined bacteriologically over a period of four

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years and statistical tables compiled from the direct germicidal action of the anti septic mouth washes and tooth-pastes in their mouths

### DISCUSSION

Bacteriology is not an exact science, and wide ranges of difference in *in vivo* experiments, with daily unaccountable variations in count and flora were met with, nevertheless, general trends were noted with some degree of reliability, especially when results coincided with whole groups of participating students

### METHOD

Ten cubic centimeters of sterile water were used as a gargle and mouth wash for 1 minute for every student participating in the experiment. At the end of the minute, the mouth wash waters were expelled into sterile test-tubes. Serial dilutions of each wash water were made and plated in ordinary nutrient agar, but in some

*Mouth Flora in vivo* per cc of wash water  
10 minutes after gargling with the following  
mouth washes

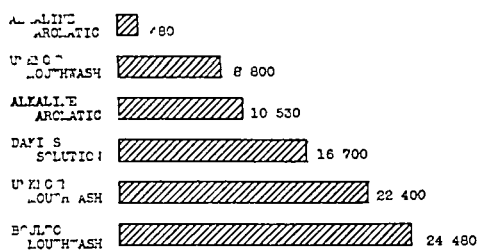


Fig 1

*Mouth Bacteria*—Average bacterial count  
of 37 students following the use of the six  
U S P mouth washes 30 minutes after gar-  
gling with them

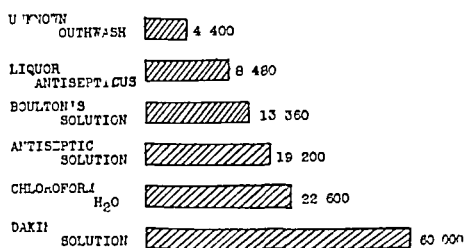


Fig 2

experiments blood serum agar was substituted. The plates were inoculated, while the culture media was at 50° C with the wash water dilution and incubated at 37° C for 48 hours. The viable mouth bacteria tended to grow out as well defined colonies at the expiration of that period. Colonies which were small, pin point, or discrete gold or yellow color, were considered as probably pathogenic, while the molds and spreaders were arbitrarily classified as harmless saprophytes. Slides were made of suspicious colonies and simple presumptive determinations made. Each plate was counted and bar graphs made to indicate the mouth floral count of each student. The mouth washings were repeated at intervals and the average counts ascertained. The individual counts were then classified according to the number of mouth antiseptic washings per day, and also information was recorded as to whether or not the patient smoked, the number of cigarettes, etc. Direct Breed counts, in which the organisms in the oral and pharyngeal cavities both living and dead were counted and classified, were also made as a check against numerical colony growth. Breed mouth counts varied from 500,000 to 500,000,000 bacteria per cc of sterile mouth wash water.

## GENERAL PROCEDURE

The immediate effects of the use of different tooth-pastes and U S P mouth washes were evaluated, by preceding the sterile mouth water rinsing with the actual use of tooth-paste or antiseptic mouth wash. Well known tooth-pastes and sterile tooth brushes were used for 1 minute to thoroughly cleanse the teeth. The usual mouth gargling with sterile water for 1 minute was followed with a plating of a fraction or dilution of the resultant gargle water. By comparing the normal flora of each student, and later entire groups of students, with the one made following the tooth brushing, the comparative value of the dentifrice was roughly ascertained. The comparative charts generally indicated a sharp decline in all mouth flora following a thorough tooth brushing, with several well-known commercial tooth-pastes. In the same manner 30 odd U S P, N F and proprietary mouth washes were evaluated, noting the decrease or increase in the number of mouth bacteria for each student following the use of the various mouth washes. The usual bar graphs were drawn up for comparative purposes. The U S P and N F mouth washes were tabulated according to their apparent efficiency in lowering the mouth flora, the proprietaries for obvious reasons were not specifically named on the charts. The time interval between the tooth brushings, or antiseptic mouth washings, and the original sterile water garglings were varied in order to find out how long it took before the bacteria were inhibited or killed by the tooth-pastes and mouth washes used. Statistical tabulations were then attempted based on the apparent time lapse for effective germicidal activity of each medicament. In recent groups of students, a record was kept of colds, influenza and other upper respiratory infections during the school year for comparative and tabulation purposes.

## CONCLUSIONS AND INTERPRETATION OF RESULTS

1 The statistical results generally indicated the value of correct oral hygiene habits in lowering the incidence of the respiratory infections, by decreasing the number of nasal and mouth flora of pathogenic bacteria.

2 The clinical and dental value of frequent tooth brushings with standard antiseptic tooth-pastes and powders was substantiated by noting the comparative counts with the resultant decrease in the number of oral and gingival membrane bacteria.

3 The results suggested a possible comparative table based on direct "*in vivo*" finding for the bactericidal activity of various U S P and N F mouth washings using plate and Breed count techniques. Tooth-paste evaluation might be determined by a similar procedure.

4 The oxidizing antiseptic mouth washes. Dakin's Solution, sodium perborate and hydrogen peroxide in 50% solution apparently increased the number of mouth bacteria per cc during the first half hour. Later the number dropped markedly, suggesting the mechanical action of the oxidizing mouth washes in liberating the bacteria from the intercellular spaces of the buccal membranes, interdental spaces, etc.

5 The results indicated variations in the time interval for the effectiveness of the bactericidal activity of mouth washes, as in many cases the organisms were not destroyed or growth inhibited until one-half to one hour after gargling.

6 Incidentally it was found that immediately after smoking, the mouth flora count appeared to be lowered, although after a time the count took a sharp upward rise, in some cases, even above the normal. Hot tobacco smoke tends to inhibit the growth of mouth bacteria, particularly destroying the highly sensitive thermolabile hemophyllic group of bacteria. However, the smoke dust particles may injure the oral epithelium, thus nullifying any hot smoke or nicotine antiseptic action, by irritating the defense mechanism of the mucous membranes.

7 Repeated microscopic Breed count studies of the mouth flora of 400 odd students revealed only a few spirilla or protozoan microorganisms, such as the *Treponema refrigens*, *Treponema Vicenti* or *Endamæba Gingivalis*, suggesting that mouth diseases are less apt to occur among the young than among adults, particularly where oral hygiene habits are the rule.

8 Sore throats, particularly among teachers, may be incited by inhalations of chalk dust, which set up mechanical irritations. The sputa of teachers so infected showed chalk dust in several samples.

9 Breed count mouth flora varied from 130,000 to 95,000,000 per cc. of wash water, in an average class of students, the Breed count included both living and dead bacteria.

10 Colony counts without the use of antiseptic mouth washes ran as high as 2,000,000 and as low as 70,000 in an average class of students. The use of tooth paste caused average drops to as low as 10,000 after thoroughly brushing the teeth with a good dentifrice.

11 Nasal and oral insufflations of 10 per cent argyrol proved effective in acute rhinitis in causing a sharp drop in the bacterial flora.

12 Boulton's solution proved to be the most valuable of the mouth washes tested for all periods from 10 minutes to 1 hour after its use, with colony counts running as low as 3000 per cc. Alkaline Aromaticus and Dobell's Solution gave mouth counts varying from 8-14,000 colonies per cc.

13 Liquor antisepticus and chloroform water appeared to be more effective half an hour to 1 hour after gargling, with viable mouth counts varying between 10 to 20,000 per cc. rinse water.

14 The three nationally advertised proprietary mouth washes tested showed favorable results at the end of 1 hour, with plate counts giving as low as 3000 for viable bacteria per cc. of rinse water.

15 The germicidal action of mouth washes tended to be transient, while effective tooth-paste and brushing had a more lasting antiseptic action, the mouth flora remaining lowered for several hours.

16 The ratio of the mouth counts was inversely proportional to the number of brushings per day. For whole groups of participating students the lowest mouth counts were obtained from those who habitually brushed their teeth 3 times a day. The next lowest counts came from those who cleansed their teeth twice a day. The highest counts were obtained from the very few students who did not cleanse their teeth at all, and the next highest from those who cleansed their teeth once a day only. These results were the most conclusive obtained in this study over a period of 4 years.

17 Ten per cent solutions of ordinary table salt proved very effective in causing decreased mouth flora in most test cases.

18 Ordinary sterile water used as a mouth wash caused decreased mouth floral counts in some instances, but the results were subject to wide variations in individual instances. Similar results were obtained after eating oranges or lemons.

#### SUMMARY

The study supported clinical and dental evidence of the practical bactericidal value of the regular use of tooth-pastes and mouth washes in keeping down the usual mouth flora of pathogenic microorganisms.

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Breed, R. S., Brew, J. D., New York State Agriculture Bulletin No. 58

### THE FIRST PHARMACIST IN NORTH AMERICA <sup>1</sup>

BY THEODORE J. BRADLEY <sup>2</sup>

In City Hall Square of the City of Quebec there stands a monument to the Canadian pioneer, Louis Hébert, who was probably the first pharmacist to establish his home and practice his profession in North America. Undoubtedly there were some pharmacists among those who accompanied Columbus, the Cabots and other explorers who discovered and visited various parts of the Americas, and some pharmacists are known to have visited this continent before Hébert came here, but we have been unable to find any indication of their having become residents. Though the records of Hébert and his work are not complete, enough is known about him to make a story of great interest.

The Atlantic coasts of Canada and New England had been visited by the Norseman, Leif Ericson, in about the year 1000, but the records of this visit are fragmentary and were forgotten for a long time. At the time Columbus discovered America, in 1492, another Genoese in foreign service, Giovanni Caboto, who is better known to us as John Cabot, had been sailing the North Seas in the service of the merchants of Bristol, England, searching for some islands thought to be in the Atlantic Ocean, far west of Ireland. When news of the discoveries by Columbus reached Cabot, he secured authority from King Henry VII and organized an expedition to sail further west than before. On June 24, 1497, he discovered land, which we now call Cape Breton Island, and the smaller St. Pierre-Miquelon Islands. The next year, in 1498, he returned with a larger expedition and explored the coasts of Labrador, Newfoundland, Nova Scotia and New England. John Cabot died soon after his return to England, in the fall of 1498, and one of his sons, Sebastian Cabot, became almost equally famous as an explorer, in the service of various countries.

John Cabot's explorations and discoveries gave England a claim to the northeast coast of North America which ultimately prevailed, but the claim was not asserted at first, and fishermen from France, Spain and Portugal, as well as those from England, were the first to take advantage of the resources of the newly discovered lands and waters. These fishermen frequently visited Newfoundland and the mainland, but no regular settlements were established for some years—in

<sup>1</sup> Section on Historical Pharmacy, A. P. H. A., Portland meeting 1935

<sup>2</sup> Dean of the Massachusetts College of Pharmacy, Boston

6 Incidentally it was found that immediately after smoking, the mouth flora count appeared to be lowered, although after a time the count took a sharp upward rise, in some cases, even above the normal. Hot tobacco smoke tends to inhibit the growth of mouth bacteria, particularly destroying the highly sensitive thermolabile hemophilic group of bacteria. However, the smoke dust particles may injure the oral epithelium, thus nullifying any hot smoke or nicotine antiseptic action, by irritating the defense mechanism of the mucous membranes.

7 Repeated microscopic Breed count studies of the mouth flora of 400 odd students revealed only a few spirillæ or protozoan microorganisms, such as the *Treponema refrigens*, *Treponema Vicenti* or *Endamæba Gingivæ*, suggesting that mouth diseases are less apt to occur among the young than among adults, particularly where oral hygiene habits are the rule.

8 Sore throats, particularly among teachers, may be incited by inhalations of chalk dust, which set up mechanical irritations. The sputa of teachers so infected showed chalk dust in several samples.

9 Breed count mouth flora varied from 130,000 to 95,000,000 per cc. of wash water, in an average class of students, the Breed count included both living and dead bacteria.

10 Colony counts without the use of antiseptic mouth washes ran as high as 2,000,000 and as low as 70,000 in an average class of students. The use of tooth paste caused average drops to as low as 10,000 after thoroughly brushing the teeth with a good dentifrice.

11 Nasal and oral insufflations of 10 per cent argyrol proved effective in acute rhinitis in causing a sharp drop in the bacterial flora.

12 Boulton's solution proved to be the most valuable of the mouth washes tested for all periods from 10 minutes to 1 hour after its use, with colony counts running as low as 3000 per cc. Alkaline Aromatic and Dobell's Solution gave mouth counts varying from 8-14,000 colonies per cc.

13 Liquor antisepticus and chloroform water appeared to be more effective half an hour to 1 hour after gargling, with viable mouth counts varying between 10 to 20,000 per cc. rinse water.

14 The three nationally advertised proprietary mouth washes tested showed favorable results at the end of 1 hour, with plate counts giving as low as 3000 for viable bacteria per cc. of rinse water.

15 The germicidal action of mouth washes tended to be transient, while effective tooth-paste and brushing had a more lasting antiseptic action, the mouth flora remaining lowered for several hours.

16 The ratio of the mouth counts was inversely proportional to the number of brushings per day. For whole groups of participating students the lowest mouth counts were obtained from those who habitually brushed their teeth 3 times a day. The next lowest counts came from those who cleansed their teeth twice a day. The highest counts were obtained from the very few students who did not cleanse their teeth at all, and the next highest from those who cleansed their teeth once a day only. These results were the most conclusive obtained in this study over a period of 4 years.

17 Ten per cent solutions of ordinary table salt proved very effective in causing decreased mouth flora in most test cases.

18 Ordinary sterile water used as a mouth wash caused decreased mouth floral counts in some instances, but the results were subject to wide variations in individual instances. Similar results were obtained after eating oranges or lemons.

#### SUMMARY

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Newfoundland probably not until about 1578 and more certainly by Sir Humphrey Gilbert in 1583 and John Guy in 1610

In the meantime, explorers and missionaries were working in this rich field Jacques Cartier, a Frenchman, discovered the Gulf of St. Lawrence in 1534, and in 1535 he sailed up this river for about a thousand miles, to the Lachine Rapids, near the site of the present city of Montreal. During the next sixty or seventy years, fishing, fur trading and missionary activities continued, and some attempts were made to establish settlements on the mainland, but these were not successful until after the beginning of the next century.

Looking back at these activities from our modern point of view, we may be surprised at the extremely slow rate of settlement of the western hemisphere. Columbus established the present city of Santo Domingo on the island of Hispaniola or Haiti in 1493, the year following his discovery of the Bahamas and that island in 1492. This was followed by the settlement of San Juan, Puerto Rico, in 1508 or 1509. Probably the first settlement on the mainland was at Panama, in 1519, followed by that of Cartagena, Colombia, in 1533, and it was not until 1565 that the first settlement in North America was made, at St. Augustine, Florida. Several other more or less permanent settlements were made on various islands, like those mentioned on Newfoundland, late in the sixteenth century. It was not until after the beginning of the seventeenth century that the tide of settlement flowed strongly, beginning with Port Royal, in Acadia (now Annapolis Royal in Nova Scotia), in 1604, and Santa Fé, New Mexico, in 1605. These were soon followed by Jamestown in Virginia, Quebec, New York and Plymouth.

Port Royal was settled under royal warrant by Pierre de Guast, Sieur de Monts, in 1604, as stated above, after an exploratory voyage in 1603, during which he visited the lower St. Lawrence and nearby lands. This was during the reigns of Elizabeth and James I in England and of Henri IV in France. It was a time of civil wars and religious persecutions, and these conditions contributed a great deal to the unrest which resulted in the establishment of several of the early settlements in America. The party of de Monts included a friend, de Poutrincourt, the subsequently famous Samuel de Champlain, and an apothecary, Louis Hébert.

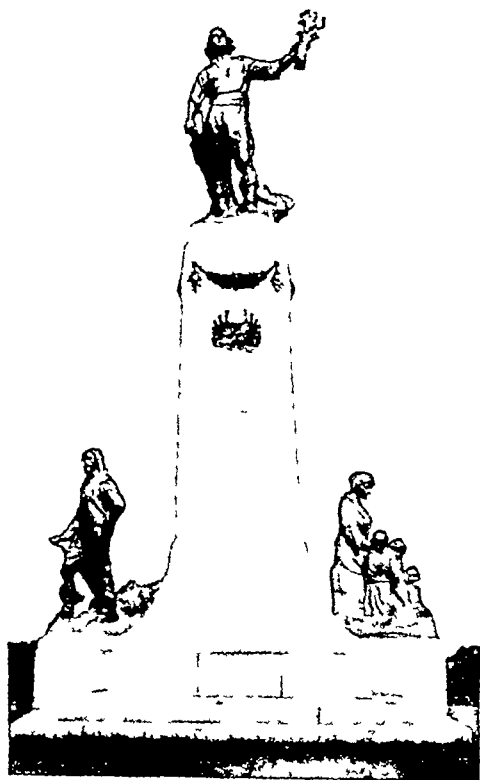
Very little is known about the early life of Louis Hébert. We have been unable to ascertain the date of his birth. It is recorded that he was a native of Paris and the son of an apothecary, and that he was himself a court apothecary when he became a member of the emigrant party of de Monts.

While he was in Port Royal, Hébert practiced as an apothecary and supplied medical advice and medicines to his fellow Frenchmen and the Indians. During this time, there was a severe outbreak of scurvy in which his services were helpful. Among the Indians to whom he gave medical service was the prominent chief, Membertou. Hébert was a devoted lover of the soil, and in Nova Scotia he began the work in agriculture which he pursued along with his practice of pharmacy during the remainder of his life. This work in agriculture made him the first Canadian farmer as well as the first pharmacist.

England claimed Acadia and other nearby lands, and in 1613 the small settlement of Port Royal was attacked and nearly destroyed by English from Virginia, who held the town for several years. In 1614, Hébert and most of the French resi-

dents returned to France. The province of Acadia, including the settlement of Port Royal, was passed back and forth between France and England several times, but ultimately came under the control of England, and the names were changed to Annapolis Royal for the settlement and Nova Scotia for the province.

Samuel de Champlain did not remain with the de Monts party for long and soon began the series of explorations which made him preeminent among Canadian pioneers. In 1608, he established a settlement on the site of an Indian village, Stadaco, which came to be called Quebec, and in 1617 he induced his old friend and companion, Louis Hébert, to try his fortune again in Canada. In the French National Library there is preserved a letter from de Monts, dated February 18, 1617, which discusses the possibilities of the development of Canadian resources and is highly complimentary to Hébert. Many difficulties had to be overcome before Hébert was able to leave France, and the ship in which he and his family sailed had a very stormy passage lasting thirteen weeks. At times all hope of reaching their destination seemed lost, but they finally sailed up the St. Lawrence and landed at Quebec, and Hébert's life there during the next ten years was one of fruitful achievement. The records indicate that he was immediately recognized as a leading citizen. Soon after landing he received a grant of land, which he worked along with his practice of pharmacy. He was indefatigable in his efforts to develop the resources of the country, and was given the title of Royal Procurator. In 1626 he received a grant of the Fief of St. Joseph in the outskirts of Quebec, and the title of *Sieur D'Espinay* was conferred upon him, in recognition of the fact that his was the first French family to establish itself in the country.



Hébert Monument in the city of Quebec

The career of Hébert was cut short in January 1627, when he died suddenly as a result of injuries received in a fall, leaving a widow and three children. He was buried in the cemetery of the Récollet fathers. Fifty years later his body was disinterred and placed in the vault of the then new convent of the Récollets in the upper town of Quebec.

Madame Hébert, born Marie Rollet, was a remarkable woman who lived for many years after the death of her husband. When Quebec was first captured by the English, in 1629, two years after the death of Louis Hébert, and many of the French inhabitants went back to France, Madame Hébert decided to keep her family in the colony, and it is recorded that this was one of only two permanently estab-



lished families remaining in Quebec When the colony was restored to France, in 1632, a Mass of thanksgiving was celebrated in the home of Madame Hébert

Louis Hébert's older daughter, Anne, married Étienne Jonquest, a Norman colonist in 1617, and it is believed that this was the first Christian marriage in New France In 1621, the younger daughter, Marie, married Guillaume Couillard de Lespinay Many Canadians trace their descent from Louis Hébert, through these daughters and his son, Guillaume Hébert

Many pharmacists have distinguished themselves in other lines of work than pharmacy, but Louis Hébert is perhaps the only one of these who won renown as a pioneer, and it was because of his work in developing the resources of Canada that the monument to him was erected in Quebec City Hall Square in 1918 His work as the first pharmacist to settle in North America is commemorated by a tablet in the town hall of Annapolis Royal, Nova Scotia, erected by the Nova Scotia Pharmaceutical Association and unveiled by the Canadian Pharmaceutical Association on August 2, 1930, with very impressive exercises, which were attended by the writer of this article as the delegate representing the AMERICAN PHARMACEUTICAL ASSOCIATION The exercises included an address by the Reverend Abbé A Couillard Despres, a direct descendant of Louis Hébert, through his younger daughter

His background and early training did not prepare Louis Hébert very well for the rough life of a pioneer Most of the colonists who came to New France during the first years of the seventeenth century were Norman peasants, prepared for the hardships of pioneers by their arduous work on the farms of Normandy Hébert was a Parisian and an apothecary, with none of these advantages It is unfortunate that there was no contemporary biographer to record his varied and helpful achievements in developing the resources of Canada His history is closely intertwined with that of the settlement of the colony, and is found in the fragmentary references to him in the records of the settlement of Port Royal and Quebec Hébert accomplished a great deal by quiet persistent work, without romantic appeal, and he was not a popular hero like Cartier, Champlain or Frontenac, but he is preeminent among those who followed the explorers of Canada and worked successfully to develop and maintain their settlements in the New World

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The characteristic of American history is that everything appears to happen by accident Nothing seems planned or intended Other nations adopt policies and pursue them, their history is formed by the clash of these policies But America moves by a kind of indirection Always in American history the unintended the apparently irrational happens 'Credo' condensed from the *Saturday Evening Post* by *Readers Digest* for May

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# THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE A A C P EDITOR OF THIS  
DEPARTMENT

More and more educational institutions are establishing their own radio stations and are sending out programs of instruction to the people of their states. Through Station W-B-A-A on the Campus of Purdue University, the people of Indiana have been informed regarding events of importance occurring on the campus, information on general subjects and information on specific subjects. Fortunately for the School of Pharmacy, fifteen minutes are set aside every week for the use of the staff. This period has become known as 'The Apothecary Hour' and each week some member of the staff presents topics that are thought to be interesting to the citizens of the State. The following two radio talks by Professors Lee and Klemme indicate the type of thing that is being done.—C B JORDAN, *Editor*

## FALLACIOUS ADVERTISING

BY C J KLEMM

No matter where we go, nor what we do, as long as we are in contact with civilization we meet the blessing and curse of organized business, *viz*, advertising. We are aroused from pleasant thought after listening to a beautiful program on the radio only to hear some zealous radio announcer dinning into our ears the marvelous qualities and virtues of some tooth-paste, mouth wash, gasoline, baby food, efervescent salt, cold remedy, body-building breakfast food, soap, dog food or other article of commerce without the use of which in the immediate future, we will surely suffer unspeakably from decayed teeth, halitosis, a stalled automobile, an undernourished baby, chronic constipation, pneumonia, weak bodies, dull gray clothes or a blemished skin, or the possession of a mangy pup. We see the same things in print, staring at us from the pages of our newspapers or favorite magazines. In the street cars, on the bill boards, on placards and posters we encounter in an endless stream the announcements of things for sale together with the usual ballyhoo. To see and hear these things, many of them as fantastic as the Tales of Baron Munchausen, is as inevitable as eating and sleeping, as unavoidable as death and taxes.

Yet, advertising is absolutely necessary to our economic existence. Without it, the commerce of the world would dwindle to the vanishing point. It is the very breath and pulse of any far-flung business enterprise. If it were not for this constant emanation of facts and fancy which we call advertising, how would John Doe of Podunk know that Richard Roe, Inc., of New York, manufactured in quantity the very article he needs, and how could Richard Roe, Inc., dispose of, at a profit, the products of quantity manufacturing without broadcasting to the world that such and such articles are available?

It is not with genuinely honest advertising that I have any desire to pick a bone, but the fallacious advertising, the misleading, erroneous, deceitful and downright false statements made about articles, some of which are no better than dozens of others of similar kind, some of which are not worth carrying home, and some of which are actually dangerous or detrimental. Those people in professions concerned with the public health, *viz*, medicine, dentistry, pharmacy, etc., probably notice and resent this type of advertising more than anyone else, largely because so many

products for internal use are often misrepresented. And yet there are many other kinds of products offered to the American public along with statements that should make even the most gullible person turn a deaf ear to them. When we see and hear about the fine qualities that can be found in one and only one brand of gasoline, and the advertiser writes or speaks with such force and fervor that one would think he actually believed these things himself, we wonder why, if we use another brand of gasoline, our car *ever* started, not to mention a cold morning. There are good gasolines and good oils, but don't expect a five-year old automobile engine to perform miracles under their influences. That smacks too much of rejuvenation, but the advertisers would have you believe their products will do just such things for our old 1928 Senile Sixes.

The vitamins, so mysterious, so intriguing, so popular, come in for more than their share of abuse. To be sure, these substances are necessary for the normal functioning of life processes, and sadly enough many diets and many foods are lacking in these important food accessories. The general public has been made aware of these facts largely by fanciful items in the tabloids and in the advertisements of certain foods and pharmaceutical products. The chief trouble with such advertisements is that so many of them are extreme exaggerations and the advertisers would have us believe that if we failed to use their own particularly vitamin rich product, our diets would be seriously impoverished and we would suffer accordingly. On the other hand, some of the powers attributed to various products by virtue of their vitamin content are truly amazing. Colds may be cured magically, pounds and pounds of weight may be added to the body, all sorts of ills and ailments may be prevented and many other startling miracles are alleged to happen under the influence of these vitamin products. Yet there is much truth contained somewhere in these wild claims, so much in fact that we cannot always say that a given claim is actually false. It is simply a fallacious claim, perhaps we may say it is the truth, twisted, stretched and distorted beyond recognition. We have a pronounced example of this in the statement that certain antiseptics have unusual germicidal powers. It may be true that a given antiseptic will kill germs in ten seconds. Undoubtedly, that is a very true statement. But what the advertiser fails completely to mention is the kind of germs which are executed so suddenly, and the conditions under which said execution is carried out. As a matter of fact the poor germs haven't a chance. Let us consider an analogy. The rays of the sun are healthful, beneficial and energy giving. Yet they can be as deadly to us as any machine-gun, perhaps not as *rapidly* fatal as the gun, but none the less sure. A person who might be exposed directly to the sun's rays for a few hours would be come so severely sunburned that he could not survive. In our ordinary, every day life we are protected from this deadly action of sunshine by clothes, trees, buildings and other things. So it is in what we might call the ordinary, every day life of a germ. Bacteria, like ourselves, are not in the habit of exposing themselves unduly, and they find their best living conditions in the microscopic crevices and abrasions of the tissues where they are snug and safe from the terrors of their "Aunt Septic". On the other hand, if we put these bacteria in a test-tube and subject them to the direct action of the antiseptic to be tested, it is no wonder they curl up and die in ten seconds. The test-tube becomes their execution chamber in which they have no protection, but let the same antiseptic be used on the tissues,

for example in the mouth, and immediately after its use a bacteriologist could demonstrate the very real and actual presence of bacteria, as full of life and kicking as strongly as ever. Thus we find that the behavior of an antiseptic is far different when applied to tissues than when it is turned loose on some poor, helpless bacteria in a test-tube, and when an advertiser claims that his antiseptic will kill germs in ten seconds, he is telling you the unsullied truth, oh quite the truth, but as the Queen of Sheba said "The half has never yet been told!"

For the past six or seven years the public has been made hyperconscious of the dangers of acidity and the benefits of alkalinity. Like the abuse of the vitamins, there are truths in what is said about acidity and alkalinity but some of them are carried too far.

It is true that the blood and tissues of the body have a definite alkalinity and this alkalinity must be maintained within very narrow limits in order for life to exist. We have in the body what is known as the alkali reserve, and, if this reserve is well built up, the body is more resistant to common infections. This fact has been the basis for a great deal of advertising on alkalinity and many products are claimed to increase the alkalinity of the body. Actually, many of them do nothing of the kind. One ailment we hear and read so much about in various advertisements is the acidity of the stomach. This or that product is recommended to be taken in the case of hyperacidity of the stomach. Curiously enough, we may have a condition which appears very much like hyperacidity but is actually due to a lack of the normal amount of acid that should be present in the stomach. Under this condition rapid fermentation takes place, producing organic acids which give this sensation of hyperacidity. In such instances the use of alkaline salts to combat the acidity is probably the worst thing that could be done. One should not continually use such alkaline salts to combat stomach disorders over a long period of time unless it be on the advice of competent medical authority, because the condition may be a serious, chronic disorder which demands medical attention.

In a way one cannot criticize manufacturers for employing these extreme measures to convince the public that their products are the best on the market, especially when their products have keen competition. Nevertheless, one should use common sense and exercise perhaps a good deal of skepticism when he reads or hears some of the claims that are made.

Thus far the advertising which we have considered is for the most part quite harmless and, while most of the statements may be true, they are merely distorted truths and very little in the way of actually false statements may be found. The truly vicious and deceitful type of advertising is largely found in connection with what we might call "cure-all" medicines. These are generally patent medicines or those of which the manufacturer keeps the formula a profound secret. Usually we find such remedies advertised as being sure cures for headaches, stomach trouble, liver disorders and all kinds of complaints. As a general rule, we might say that the greater the claims for these remedies, the more they should be avoided.

The question naturally arises as to how one may separate the wheat from the chaff in the advertisements that we see and hear. If you are in doubt as to the validity of an advertising statement, consult some one who is an expert in the field of the product about which you are interested. If the product is sold in a drug store, consult your local druggist, and I am sure that he will give you the most

honest information that is available about the product concerned. When it is a question as to the use of some medicine or various remedies, consult your physician. He is a highly trained specialist in this field and his advice is the best that you can obtain.

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## PHARMACY THROUGH THE AGES

BY C O LEE

### HERBALISTS AND THEIR HERBS

Modern medical practice is much less dependent upon crude drugs and their preparations than that of generations past. It is interesting to note, however, the importance of vegetable and animal drugs in ancient materia medica. This is a story about ancient herbalists and their medicines.

### HERB DOCTORS IN OUR DAY

During the first decade of the present century I served my druggist's apprenticeship in a drug store in a small town in southeast Kansas. In the town there lived an old Indian Herb Doctor. At least he was known as a doctor, and claimed to be part Indian and to know something about Indian herbs and medicines.

He used to spend a day, now and then, in the woods gathering herbs. These he used, presumably, in preparing his famous tonic which he sold in the mining towns of that region.

The old doctor came to our drug store and made small purchases of a few things which could not be found in the woods. He was an interesting character. His hair was long enough to fall leisurely about his stooped shoulders from beneath a broad brimmed hat. He was not much of a conversationalist but was interesting when he talked. His remarks were often critical and pessimistic, yet he was, on the whole, rather philosophical.

He had a shed for a laboratory and a medicine wagon, properly decorated, for his sales excursions. The old doctor was not well known to his neighbors, he revealed no medical secrets and minded his own business.

This story is not, I am sure, an unusual one but it is an example of the secrecy and mystery which so often surrounds makers and sellers of strange medicines. It shows, I think, that certain herbal systems appeal to those anxious folks who never cease to be concerned about their ailments, whether real or imaginary. It has always been so and will continue to be for many generations yet to come.

### FAITH IN HERBS

We will never know who were the first to use plants and herbs as medicines. Neither are we sure that herbs were first used for purposes of curing diseases or whether they were used to discourage evil spirits or demons presumably responsible for the afflictions of mankind. At any rate plants have been used by all primitive peoples, so far as we know, for healing the sick and for purposes of poisoning enemies. Many plants are poisonous when taken in amounts larger than medicinal doses.

The savage learned all of this by many sad experiences, no doubt, and made

use of the knowledge he had gained whenever he could Primitive peoples, not unlike ourselves, feared disease In their attempts to cure or frighten away disease it is quite possible that their patients succumbed to the treatment rather than the ailment We sometimes feel that this happens to us even to-day

#### PLANT LORE AND SUPERSTITION

Plant lore of primitive folks was not free from their superstitions The appearance of the parts of plants used, the conditions under which they had grown, were gathered and prepared for use, were often of great significance For example, three rather well-known root drugs, because of their forked, human-like shape were, according to tradition, possessed of strange properties One of them, Mandragora, was used by the Greeks in their love potions Mandrake is mentioned in the old testament as an antisterility cure Ginseng, which at one time grew abundantly in the woods of Indiana, is highly prized by the Chinese and Koreans as a panacea for all ills, so far as we know, it is practically inert The more nearly like the human form the Ginseng roots are the more valuable they become

It is interesting that fetishism for certain crude drugs has continued through thousands of years of human history The reputation that such and such a medicine is a very old secret remedy appeals to the daily run of imaginations, while the facts of science go unheeded

#### ANCIENT HERBAL DOCTORS

The nations of antiquity, it seems, had their herbalists who knew something about plants and their uses in the treatment of disease Among these peoples may be included the Sumerians, Egyptians, Indians, Chinese, Babylonians, Persians, Assyrians, Nubians and, perhaps, others The primitives of all of these peoples associated the curative properties of plants with their gods As the priesthood developed the priests were often the ones who knew plants and their uses The priests, it was assumed, got their information from the gods whom they served and worshiped

In their ministrations the priests learned the value of suggestion and mixed psychology with their medical treatments The patients, in addition to swallowing bitter decoctions, had to listen to the songs and incantations of the ancient crooners Even so the minds of the patients were diverted from their own miserable selves and centered upon the utterances of the soothsayers Under such conditions medicines were doubtless less bitter and pains less severe

Coleridge was surely right when he said, "The best inspirer of hope is the best physician "

#### CHINESE AND INDIAN HERBALS

The Chinese system of medicine and pharmacy has existed hundreds of years with but slight change Many strange philosophical explanations and beliefs have been woven into their knowledge of anatomy, physiology and pharmacology Their materia medica comes largely from the plant and animal kingdoms, although they use a number of inorganic minerals and their compounds The old system is giving away slowly to modern medical science

Early Indian herbal medical practices are rather obscure although they must have existed

## EGYPTIAN GODS AND GODDESSES OF MEDICINE

Primitive peoples everywhere, it seems, associated the art of healing with their gods and considered it a divine art. These people lived in the great out-of-doors and depended for a living upon the plants that grew about them, whether wild or cultivated. Their gods were gods of the natural world who knew all about vegetation, the heavens and plants of medicinal virtue.

*Osiris* was such a god to the Egyptians. The wonderful *Maat* plant was in the form of the body of *Osiris*. His followers ate the plant and, in so doing, became like the god they worshiped and lived on forever. A beautiful idea for childlike imaginations.

*Isis*, the twin sister, wife and protector of *Osiris* was a great herbalist and magician. She used her magical powers perhaps more than her skill as an herbalist, although according to tradition she made good use of both.

## SCHOOLS OF HERBALISTS

It is thought that schools of herbalists existed in Egypt as early as 3000 B. C. The works of such schools have not, however, come down to us.

It has been stated that magic played such a prominent part in early medical practices that it is difficult to find an account of herbal science free from the feats of magic. Budge says that, "the progress of herbal science was strangled by the belief in magic which was general among the people."

## ASSYRIAN AND SUMERIAN HERBALS

From the sources of information at hand it would seem that the Sumerians and early Egyptians were contemporaries and perhaps gained much of their early medical and herbal knowledge from a common source. Sumerian herbals are said to have existed in the third millennium B. C. A Sumerian tablet, in the British Museum, has a note attached which states that it was copied from a tablet written about 2200 B. C. Copies of other medicinal texts have also been found which are much older than the one just mentioned.

Some knowledge of Assyrian Herbals has been obtained from the fragments of the clay tablets which have been found among the ruins at Nineveh. Thompson, in 1924, prepared a monograph entitled *Assyrian Herbal*. As a result of Thompson's studies it is known that the Assyrians knew about 250 vegetable drugs and about 120 mineral drugs in addition to many others which, as yet, remain unidentified.

The Assyrian herbalists arranged their drugs according to their needs. It is quite obvious that the doctors and chemists of Nineveh knew a great deal about their herbs and their uses. They established "physic gardens" as a means of assuring themselves constant and reliable sources of useful medicinals. These gardens were often founded in connection with the temples and palaces. This fact indicates a considerable advancement in the matter of protecting the source and quality of their drug plants.

In Assyria, as in other ancient countries, the herbalist physician did not resort to the use of drugs alone in the treatment of the sick. He worked with the priest and the seer. The patient had to endure three doctors in one treatment. The physician prescribed the herbs, the priest recited songs and prayers and the seer interpreted the signs and omens which were in evidence. Even so three doctors

should be better than one any time, especially if each were a specialist in his own field, otherwise they might not agree

#### GREEK HERBALS AND HERBALISTS

Like the Egyptians, Sumerians and Assyrians, the Greeks believed that the gods were the first herbalists and physicians

The Greek Herbals were compiled by the lay herb-doctors and physicians who were known as the Asclepiadae. They wandered about the country and made their living by treating the sick wherever they found them

Hippocrates (B C 460-377) is known as the "Father of Medicine." He is supposed to have learned a great deal about medicine from the Egyptians and to have been the founder of a scientific system of medicine. He tried to clean things up by banishing superstition and magic from the practice of medicine. He used about 400 drugs in his practice, most of which were vegetable in character. So far as is known he compiled no herbal but undoubtedly made use of those known.

The first Greek Herbal was compiled by Diocles Carystius in the fourth century B C. This Herbal is not extant to-day, but was a list of plants, their habitats and their medicinal properties.

Aristotle (B C 384-322) is credited with *De Plantis*, a list of over 500 plants, which is included in his numerous works.

Theophrastus (B C 372-285) in his *Historia plantarum* described over 500 plants. He is referred to as the first scientific botanist rather than a medical botanist.

Herophilus, in the third century B C, made up heterogeneous mixtures of vegetable drugs and gave them in large doses to his patients. He was criticized for his large doses.

Crateuas (B C 120-63) was a great herbalist and in his Herbal he made drawings for the plants he had named.

Perhaps the greatest of the ancient herbalists was Dioscorides who lived in the first century A D. He was, for a time, physician to the Roman army in Asia. He also traveled extensively in Europe and got his information about plants firsthand. He is famous for his work of five books known as *De Materia Medica*.

He compiled information which had been made available by the herbalists who had preceded him. To this he added the information which he gained by experience and travel. His Herbal was so complete and well done that our modern Pharmacopoeias still contain many of the drugs which he described and used.

Other famous herbalists could be named but we must close with a brief mention of Galen who lived A D 130-200. Budge says, "The Greek Herbal assumed its final form in the hands of Claudius Galen,—" He traveled extensively and is credited with having written about 400 works, 275 of these were of a medical nature and 83 of them are extant and considered genuine. His entire works have never been translated. Galen was famous, among other things, as a medical teacher. His Herbal, *De Simplicibus*, was contained in Books VI, VII and VIII of his chief work. It was so nearly final that it was never superseded by succeeding Greek and Roman botanists.

The head of this famous physician and pharmacist may be seen as the keystone in the arch over the front entrance to the pharmacy building on our campus.



(Scientific Section Continued from Page 618)

A CHEMICAL STUDY OF THE FIXED OIL OF POKE ROOT \*<sup>1</sup>BY SAMUEL W GOLDSTEIN<sup>2</sup> AND GLENN L JENKINS

The root of *Phytolacca americana* (*decandra*) Linné (poke) has been an official drug since 1820 but no report has been published on the constituents of the fatty oil which this root contains. The present work was undertaken in the course of a complete phytochemical study of poke root.

The root used in this work was supplied by S B Penick and Sons and was collected near Asheville, North Carolina.

## EXPERIMENTAL

Twenty two kilograms of finely powdered poke root were extracted with petroleum benzine (b p 30° to 60° C) in a Lloyd extractor until the drug was exhausted. Most of the benzine was removed by distillation under reduced pressure, and a current of air was passed over the residue to remove the remaining solvent. The residue was dissolved in hot alcohol and the mixture on standing over night formed a deposit and a clear supernatant liquid which was removed.

*Isolation of a sterol-like Compound*  $C_{31}H_{40}O$ —Small portions of the solid substance gave color reactions with the Liebermann Burchard (1) and Hager-Salkowski (2) reagents for sterols. In the latter case, however, the red color produced was more pronounced in the sulfuric acid layer than in the chloroform layer. A chloroformic solution of the substance decolorized a bromine solution. The substance was readily soluble in hot ethyl acetate and hot ethyl alcohol, and was deposited from the solutions while still warm but the coloring matter present behaved in a similar manner. A solution of the substance in hot ethyl acetate was prepared and was boiled with animal charcoal for several minutes then filtered while hot through a Gooch funnel by means of a hydraulic suction pump. On cooling, crystals formed in rosettes. These crystals were removed by filtration and washed with ethyl acetate, then they were dried in an oven for thirty minutes at 95° C. The dried crystals melted at 107–108° C. Tests for nitrogen and sulphur gave negative results.

0.003964 Gm gave 0.012062 Gm  $CO_2$  and 0.004326 Gm  $H_2O$

C = 82.99 H = 12.21 per cent

$C_{31}H_{40}O$  requires C = 83.05 H = 12.13 per cent

0.0280 Gm dissolved in 14 cc of chloroform gave  $\alpha_D^{26} = +0.14^\circ$  in a 100 mm tube  
 $[\alpha]_D^{26} = +70.0^\circ$

Two portions of the substance were refluxed for two hours with acetic anhydride and acetyl chloride respectively. The crystals obtained on cooling in both cases were separated and recrystallized. The melting points of 107–108° C indicated that no reaction had occurred and this was confirmed by running mixed melting points of the original substance with the products obtained by the above treatment. The oxygen present in the molecule apparently is not present in the form of a free hydroxyl group.

The alcoholic solution obtained from the petroleum benzine extractive was freed from alcohol by evaporation and the final traces of the solvent were removed by heating the residual oil on a boiling water bath under reduced pressure. The oil obtained weighed 96.41 Gm representing 0.44 per cent of the dried root used. The following constants for the oil were determined: Specific gravity  $^{25}_4$  0.9209, optical rotation  $[\alpha]_D^{26} = +13^\circ$ , refractive index  $N_D^{26} = 1.4741$ , acid number 71.97, saponification number 139.43, ester number 67.46, iodine number 69.14.

\* Scientific Section A Ph A Portland meeting 1935

<sup>1</sup> From the Department of Pharmaceutical Chemistry, University of Maryland School of Pharmacy.

<sup>2</sup> Abstracted in part from a thesis submitted by Samuel W Goldstein to the Graduate School of the University of Maryland in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

*Isolation of Free Fatty Acids*—Fifty five grams of the oil were dissolved in 1200 cc of ether and the solution was successively extracted with portions of 5 per cent solutions of ammonium carbonate, sodium carbonate and potassium hydroxide

The ammonium carbonate shakings were acidified with diluted hydrochloric acid, and the mixture was extracted with ether. The ethereal solution was dried with anhydrous sodium sulphate and then the ether was removed by distillation. The oily residue was dissolved in alcohol and the silver salt was prepared using silver nitrate solution. The silver salt was analyzed

0.474 Gm of salt gave on ignition 0.0201 Gm of Ag

Ag = 42.4 per cent

$C_8H_{16}O$  Ag requires Ag = 43.0 per cent

Although the figures thus obtained are in fairly close agreement with those required for the silver salt of an octanoic acid, it is probable that the oily acid substance was a mixture

The sodium carbonate shakings were obtained in two portions and these were examined separately

**Portion I** The reddish brown aqueous solution was treated with animal charcoal, and after cooling, was acidified with diluted sulphuric acid and extracted with ether. The ethereal solution was dried and the ether was removed by distillation. The orange colored residue was dissolved in alcohol and the alcoholic solution was kept at 10° C. The crystals which were deposited in the alcoholic solution were separated by filtering through a Gooch funnel with suction. The crystalline solid (1.75 Gm) was dissolved in alcohol and recrystallized. After drying in a desiccator, the melting point was 72–73° C. Recrystallization from methyl alcohol and then from glacial acetic acid raised the melting point to 76–77° C. The silver salt was prepared and analyzed

0.0265 Gm of salt gave on ignition 0.0063 Gm of Ag

Ag = 23.77 per cent

$C_{20}H_{39}O$  Ag requires Ag = 25.67 per cent

The above described substance was thus identified as arachidic acid

The alcoholic mother liquor from which the arachidic acid had been obtained was concentrated and kept at 5° C over night. A small amount (0.55 Gm) of crystalline matter was deposited and this was removed and recrystallized from alcohol. The crystals melted at 61° C. The silver salt was prepared and analyzed

0.1229 Gm of salt gave on ignition 0.0361 Gm of Ag

Ag = 29.37 per cent

$C_{16}H_{31}O_2$  Ag requires Ag = 29.7 per cent

The crystals were thus identified as palmitic acid

The alcoholic mother liquor from which the palmitic acid had been obtained was further concentrated and kept at 10° C. A solid separated in small spherical bundles of crystals. The solid (0.4 Gm) was removed and recrystallized from alcohol. The crystals melted at 51° C. The silver salt was prepared and analyzed

0.1371 Gm of salt gave on ignition 0.0405 Gm of Ag

Ag = 29.54 per cent

$C_{14}H_{27}O_2$  Ag requires Ag = 30.72 per cent

The crystals were thus identified as myristic acid

The alcoholic mother liquor from which the myristic acid had been obtained was kept at 5° C, when crystals were deposited. The crystals (0.5 Gm) were removed and after recrystallization from alcohol melted at 59–60° C. The silver salt was prepared and analyzed

0.0632 Gm of salt gave on ignition 0.0183 Gm of Ag

Ag = 28.95 per cent

$C_{17}H_{33}O_2$  Ag requires Ag = 28.6 per cent

The crystals were thus identified as margaric acid

Two more fractions (0.5 Gm. and 0.8 Gm.) of crystalline matter were obtained from the alcoholic mother liquor and although the melting points of the crystals were 53–56° and 46–48° C. respectively, the analyses of the silver salts corresponded fairly well with the required results of margaric acid. Apparently some other substance had been removed along with the margaric acid to cause a lowering of the melting point.

The residual alcoholic mother liquor decolorized a chloroformic solution of iodine. The alcohol was removed and the liquid residue was kept for a short time at 10° C., when it solidified. A silver salt was prepared and analyzed:

0.1115 Gm. of salt gave on ignition 0.0279 Gm. of Ag

Ag = 25.02 per cent

$C_{18}H_{33}O$  Ag requires Ag = 27.72 per cent

The above described residue probably consisted of oleic acid and some saturated acid or acids which had not been removed by fractionation.

**Portion II.** The second portion of the sodium carbonate shakings was treated as under Portion I, and the alcoholic solution obtained was kept at 10° C. The crystals (0.5 Gm.) which were deposited were separated by filtration and after recrystallization from glacial acetic acid they melted at 72–73° C. The silver salt was prepared and analyzed:

0.0155 Gm. of salt gave on ignition 0.0037 Gm. of Ag

Ag = 23.87 per cent

$C_{18}H_{33}O$  Ag requires Ag = 25.67 per cent

The crystals were thus identified as arachidic acid.

The alcoholic mother liquor was concentrated and kept at 10° C. The crystals (1.1 Gm.) which were deposited were removed and after recrystallization from glacial acetic acid melted at 58.5° C. The silver salt was prepared and analyzed:

0.0810 Gm. of the salt gave on ignition 0.0239 Gm. of Ag

Ag = 29.5 per cent

$C_{18}H_{31}O$  Ag requires Ag = 29.7 per cent

The crystals were thus identified as palmitic acid.

The potassium hydroxide shakings from the ethereal solution of the oil had a red color which changed to yellow on acidification with diluted sulphuric acid. The amount of the substance liberated by the sulphuric acid was too small to investigate.

**Saponification of Oil.**—The ethereal solution of the oil which had been shaken with the alkalis was washed free of alkali by shaking with water, then dried with anhydrous sodium sulphate, and the ether was removed. The oily residue (33.2 Gm.) was very limpid as compared to the original oil. The oil was saponified according to A. Boemer's method (3). After saponification and addition of 200 cc. of water the liquid was allowed to cool to room temperature and then was extracted repeatedly with ether. The ethereal extractions were thoroughly washed with water and the ether was removed, leaving a reddish brown solid. The residue was dissolved in hot 95 per cent alcohol leaving a very small amount of an amber colored oily substance which did not dissolve.

The substance which did not dissolve in hot alcohol was soluble in hot acetone and cold chloroform. It gave negative Hager-Salkowski and Liebermann-Burchard tests for sterols. The substance may possibly have been a hydrocarbon of low molecular weight.

**Isolation of Hentriacontane.**—The hot alcohol soluble portion (300 cc. of solution) of the residue obtained from the ethereal shakings when allowed to cool and stand over night deposited a small amount of solid matter. The solid (0.5 Gm.) was separated and after recrystallization from ethyl acetate melted at 67.4° C. Using an ethyl acetate solution of the substance faintly positive tests for sterol were observed. The crystals were not affected by concentrated sulphuric acid and they did not react with acetic anhydride. After recrystallization from chloroform and then from alcohol the melting point was found to remain at 67.4° C.

The above described substance from its manner of isolation, chemical inactivity and melting point was identified as hentriacontane.

*Isolation of a Sterol (Phytolaccasterol)  $C_{30}H_{48}O$   $H_2O$* —The alcoholic solution from which the hentriacontane had been obtained was concentrated to one half its volume (150 cc) and allowed to stand. Crystals, in the form of platelets, formed in a few hours. The crystals (1.0 Gm) were removed and recrystallized from a mixture of ethyl acetate and alcohol (1:1), and then from ether. The melting point was 168–169° C. Further recrystallization from ether raised the melting point to 169–170° C. A chloroformic solution of the substance decolorized a bromine solution. Color reactions were observed with the Liebermann Burchard and Hager-Salkowski reagents for sterols, but in the latter case the sulphuric acid layer exhibited a deeper red than the chloroform layer.

0.004191 Gm. gave 0.012413 Gm.  $CO_2$  and 0.004467 Gm.  $H_2O$

C = 80.78, H = 11.93 per cent

$C_{30}H_{48}O_2$  requires C = 81.00, H = 11.79 per cent

0.0710 Gm. after heating for 4 hours at 106° C. lost 0.0029 Gm. of  $H_2O$ .  $H_2O$  = 4.08 per cent

1 molecule of  $H_2O$  of hydration = 4.05 per cent

$C_{30}H_{48}O_2 = C_{30}H_{46}O \cdot H_2O$

0.0303 Gm. dissolved in 15 cc. of chloroform gave  $\alpha_D^{26} = +0.07^\circ$  in a 100 mm. tube  
 $[\alpha]_D^{26} = +35.0^\circ$

The compound was boiled with acetic anhydride for 3 hours. On cooling, platelets with a mother of pearl lustre were formed. The crystals were separated from the solution by filtration and after recrystallization from alcohol and then from ether the melting point remained at 183–183.5° C. The acetyl derivative was recrystallized again from petroleum benzine and only perfectly clear platelets were used to determine the melting point which was 183–183.5° C.

0.0518 Gm. reacted with 1.13 cc. of 0.1N KOH

Gram molecular weight = 458.4 Gm

0.004008 Gm. gave 0.012039 Gm.  $CO_2$  and 0.004326 Gm.  $H_2O$

C = 81.92, H = 11.33 per cent

$C_{32}H_{52}O_2$  requires C = 81.97, H = 11.19 per cent

Gram molecular weight = 468.4 Gm

The original compound recovered from the saponification mixture and recrystallized from alcohol melted at 169–170° C.

The compound  $C_{30}H_{48}O$  described above was proved to be a monohydroxy sterol isomeric with the amyrins (m.p. 170° C.) isolated by Tschirch and Cremer (4) from the different sorts of elemi. Vesterberg (5) resolved the amyrins into alpha-amyrin (m.p. 181–181.5° C.) and beta-amyrin (m.p. 193–194° C.). He also prepared the acetyl derivative of the unresolved amyrin and found it to melt at 200° C. and on crystallizing from ligroin solution obtained two crystalline forms, i.e., leaflets and prisms, which he identified as alpha-amyryl acetate (m.p. 220° C.) and beta-amyryl acetate (m.p. 235° C.). Attempts to resolve the acetate of the compound isolated by us into more than one compound were unsuccessful, and the different melting point obtained with clear leaflets from benzine solution indicates that the compound differs from the previously reported isomers.

The mother liquor from which the sterol had been obtained, on further concentration and standing, yielded another small crop (0.1 Gm.) of the same compound.

*Isolation of Combined Fatty Acids*—The alkaline, aqueous solution which had been extracted with ether was acidified with diluted sulphuric acid. The solution was found to contain formic acid by testing with ammoniacal silver nitrate solution. The solution was then extracted repeatedly with ether. The aqueous solution remaining after the ether extractions was neutralized and evaporated to dryness on a water bath. The residue, after extraction with alcohol ether and removal of the solvent, gave a faintly positive test for the presence of glycerin. The ethereal solution of the liberated fatty acids was dried and the solvent was removed. The residue, on cooling, solidified to a dark reddish brown mass. The solid (1.0 Gm.) that separated was removed, and after recrystallization from alcohol ethyl acetate and finally from a mixture of ethyl acetate and alcohol the granular product melted at 75–76° C. The silver salt was prepared and analyzed.

0.0652 Gm of salt gave on ignition 0.0169 Gm of Ag  
 Ag = 25.6 per cent  
 $C_{16}H_{32}O$  Ag requires Ag = 25.67 per cent

The substance was thus identified as arachidic acid

The mother liquor was concentrated and kept at  $10^{\circ}C$ . The solid (0.5 Gm) which separated was removed by filtration. The solid appeared to have adsorbed some amber colored oily substance which caused part of the mixture to liquefy when the mixture was heated to about  $27^{\circ}C$ . The solid was dissolved in alcohol and precipitated as the colorless silver salt which was analyzed. The colored portion remained in the alcohol.

0.0614 Gm of salt gave on ignition 0.0173 Gm of Ag  
 Ag = 28.17 per cent  
 $C_{17}H_{34}O$  Ag requires Ag = 28.6 per cent

The substance was very probably margaric acid with some impurity which appeared to be some of the original oil that had not been saponified.

The mother-liquor was again concentrated and, when no solid separated on cooling, the remainder of the solvent was removed. A mixture of solid particles in oil was obtained. An attempt to separate the oil from the acids by forming the sodium salts of the free acids and removing the oil by extracting with ethereal solvents was unsuccessful. The acids were again liberated with diluted sulphuric acid and the mixture was extracted with chloroform. The chloroform was removed leaving 13.5 Gm of a reddish brown semi solid residue. The residue was refluxed on a water bath with 28 cc of methyl alcohol and 0.7 cc of concentrated sulphuric acid for 5 hours, and then the excess methyl alcohol was removed. The residue was taken up in ether, the ethereal solution was washed with water to remove the sulphuric acid, then the ethereal solution was dried and the ether removed. The remaining liquid methyl esters were distilled under a pressure of 10 mm of mercury. A negligible amount of distillate came over between  $173^{\circ}$  and  $189^{\circ}C$ , about 5 cc of distillate came over at  $190^{\circ}C$ , and a small amount of distillate came over between  $191^{\circ}$  and  $215^{\circ}C$ . The latter distillate which was collected separately was discarded. The distillate which had been collected between  $173^{\circ}$  and  $190^{\circ}C$  was refluxed on a water bath with 10 per cent sodium hydride in 70 per cent alcohol for 2 hours. The saponified solution was shaken with ether to remove any unsaponified oil and liberated substances other than the acids. The aqueous solution was then acidified with diluted sulphuric acid and was extracted repeatedly with ether. The ethereal solution was washed with water, dried with anhydrous sodium sulphate, the solvent removed and the solid residue was taken up in warm alcohol. The first crop of crystals weighing 0.1 Gm obtained at room temperature melted at  $58.5^{\circ}C$ . The silver salt was prepared and analyzed.

0.0413 Gm of salt gave on ignition 0.0124 Gm of Ag  
 Ag = 30.0 per cent  
 $C_{16}H_{32}O$  Ag requires Ag = 29.7 per cent

The compound was very likely palmitic acid with a small amount of impurity.

The mother liquor was concentrated and kept at  $10^{\circ}C$ . The solid (2.0 Gm) which separated was removed and after recrystallization from alcohol melted at  $62-62.5^{\circ}C$ . The silver salt was prepared and analyzed.

0.1010 Gm of salt gave on ignition 0.0308 Gm of Ag  
 Ag = 30.0 per cent

$C_{16}H_{32}O$  Ag requires Ag = 29.7 per cent

The acid melts at  $62-62.5^{\circ}C$

$C_{16}H_{32}O$  melts at  $62.6^{\circ}C$

The methyl ester was collected at  $190^{\circ}C$  (10 mm)

$C_{16}H_{32}O \cdot CH_3$  boils at  $196^{\circ}C$  (15 mm)

0.0596 Gm of the acid required 2.34 cc of 0.1N KOH, corresponding to 220.3 mg of KOH per Gm of acid

$C_{16}H_{32}O$  has a neutralization value of 219.1 mg of KOH per Gm of acid

Molecular weight determined from the acid value is 253.9

$C_{16}H_{32}O$  = 256.34

The above described compound was thus identified as palmitic acid

The mother liquor was concentrated and kept at 10° C. A crop of crystals (1.0 Gm.) was obtained, which, after recrystallization from ethyl acetate, melted at 61–62° C. This, undoubtedly, was a further yield of palmitic acid.

The mother liquor was found to react readily with bromine. The alcohol was removed, leaving a residue which was liquid at room temperature and which solidified when kept at 10° C. The liquefied substance gave a positive claudin reaction when treated with concentrated nitric acid and copper wire. The silver salt was prepared and analyzed.

0.1756 Gm. of salt gave on ignition 0.0503 Gm. of Ag

Ag = 28.6 per cent

$C_{18}H_{33}O_2Ag$  requires Ag = 27.7 per cent

Methyl oleate distills at about the same temperature as methyl palmitate.

The above described residue probably consisted mainly of oleic acid together with some acid or acids which had not been removed by fractionation.

### SUMMARY AND CONCLUSIONS

1. The fatty oil obtained by extracting dried poke root with petroleum benzine was found to have the following constants: Specific gravity<sub>25°</sub> = 0.9209, optical rotation,  $[\alpha]_D^{26} = +13^\circ$ , refractive index,  $N_D^{26} = 1.4741$ , acid number, 71.97, saponification number, 139.43, ester number, 67.46, iodine number, 69.14.

2. Chemical investigation of the fatty oil proved it to be a complex mixture containing a large proportion of free fatty acids, some esters of fatty acids with glycerol, and wax-like esters of fatty acids with a sterol.

(a) A sterol-like compound,  $C_{23}H_{40}O$ , melting at 107–108° C., and having an optical activity of  $[\alpha]_D^{26} = +70.0^\circ$ , was isolated. The oxygen present in the molecule does not behave as a part of a free hydroxyl group, since boiling with acetic anhydride and with acetyl chloride had no effect on the compound.

(b) A sterol (phytolaccasterol),  $C_{30}H_{50}O \cdot H_2O$ , melting at 169–170° C., and having an optical activity of  $[\alpha]_D^{26} = +35.0^\circ$ , was isolated. It is isomeric with the amyrins isolated by Tschirch and Cremer (4), but the differences in the behavior of the acetates prove them to be dissimilar. Phytolaccasterol was proved to be a monohydroxy compound by the saponification of its acetate, from which procedure a molecular weight of 458.4 was calculated as compared with 468.4 as determined by analysis.

(c) A hydrocarbon, hentriacontane ( $C_{31}H_{64}$ ), was isolated and identified by its manner of separation and by its inactivity with chemical reagents, and its melting point of 67.4° C.

(d) The following fatty acids were isolated: Arachidic, 5.91 per cent, palmitic, 8.63 per cent, margaric, 4.19 per cent, oxymyristic, 0.72 per cent. The presence of oleic acid, acids of low molecular weight and glycerol was proved.

### REFERENCES

- (1) Lewkowitsch, J., 'Chemical Technology and Analysis of Oils, Fats and Waxes' 1, 276 (1921)
- (2) Lewkowitsch, J., *Ibid.*, 1, 275 (1921)
- (3) Boemer, A. *Ztschr. Untersuch. Nahrungsm.* 1, 21 (1898)
- (4) Tschirch and Cremer, *Arch. Pharm.*, 240, 293 and 322 (1902)
- (5) Vesterberg, *Ber.*, 20, 1242 (1887)

# ASSOCIATION BUSINESS

## AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION 1935-1936

Office of the Secretary 2215 Constitution Ave., Washington D C

### LETTER NO 23

June 17 1936

*To the Members of the Council*

147 *Use of Text of N F VI* Motion No 67 (Council Letter No 22 page 555) has been carried and Lea & Febiger have been so advised

The following letters have been received from Chairman DuMez of the Committee on Publications

"The request from William Wood & Company for permission to quote portions of the National Formulary VI in a revised edition of Stedman's Practical Medical Dictionary is one of a type which it has been our custom to grant I therefore recommend that the Council grant permission to William Wood & Company to use portions of the text of the N F VI in the revision of Stedman's Practical Medical Dictionary "

Inasmuch as the request of W H Blome to use portions of the text of the N F VI in the revision of Washburn's and Blome's textbook on pharmacognosy and materia medica does not involve any new features I recommend that permission be granted and that the payment of the fee previously charged, namely \$5 00 be again required "

(*Motion No 70*) It is moved by DuMez that William Wood & Co and Washburn and W H Blome be granted permission to use the text of the N F VI in a revised edition of Stedman's Practical Medical Dictionary and in a revised edition of a textbook on Pharmacognosy and Materia Medica, respectively with the customary acknowledgment and the usual fee of \$5 00 in each case

148 *Request for Additional Compensation on Account of Printing and Binding the N F VI* Motion No 66 (Council Letter Nos 21 and 22 pages 472 and 555) has been carried and the Mack Printing Company will be paid the amount requested

149 *Committee on Pharmacy Week* Two members of the Council have sent in comments on the recommendations as submitted with Council Letter No 22 Other members who wish to submit comments are requested to do so promptly in order that a decision may be reached

150 *Election of Members* Motion No 69 (Council Letter No 22 page 556) has been carried and applicants for membership numbered 350 to 360 inclusive are declared elected

151 *Applicants for Membership* The following applications, properly endorsed and accompanied with the first year's dues have been received

No 361 Thomas Lloyd Barnhart 316 Mills Ave., Braddock Penna., No 362 Edward Bardell Yeager 2300 Arlington Ave. Carrick, Pittsburgh Pa., No 363 Angelus Edward Rihn 936 Fifth Ave. Ford City Pa., No 364 E Alfonso Singleton, 319 N 2nd St. Reading Penna. No 365, Ora H Ellis 124 Des Moines St. Des Moines Iowa, No 366, R A Kramer 147 Waverly Place, New York N Y., No 367 Selwyn George Davis 5357 Santa Monica Blvd., Hollywood Calif. No 368 J Louis Lanz 6300 Etzel Ave. St Louis Mo. No 369 J B Whitney Jr 12-16 Gellhall Plaza Kansas City Mo. No 370, Hugo Mock 10 E 40th St., New York N Y. No 371 Robert R Pierce 457 High St. Morgantown W Va. No 372 Lynn L Carson, 700 Charles St. Wellsburg W Va., No 373 Gaylord Hess Dent 130 Fayette St. Morgantown W Va. No 374 E Guy Robertson 840 13th Ave. Huntington W Va. No 375 Harry Alan Goody Loontz 906 Raleigh Terrace Bluefield W Va. No 376 Percy S Walker 201 W 6th Ave. Topeka Kans., No 377 Gune Krishna Gangadhar, Court Road Ahmednagar Bombay, India

No 378, Rudolph Schuffmann Steward, 1734 N Main St, Los Angeles, Calif, No 379, Hans Johann van Giffen, No 9 Vondelstraat Amsterdam, Holland, No 380 James Vans MacDonald 929 W Georgia, Vancouver, B C, Canada, No 381, J Otto Kohl McMicken Ave and Mohawk Pl Cincinnati, Ohio, No 382, Raul Arturo Trillo, 236 Lewis St, Memphis Tenn No 383, Gail Albert Wiese, Anita, Iowa, No 384, Charles T Longo, 410 1/2 Clinton St Brooklyn N Y, No 385, Tarvin A Hoops Powell, Wyo, No 386, Frederick A Fuhrman Coquille, Ore No 387, Albert Rice, 1032 N Parkside Ave, Chicago, Ill, No 388, Marvin Klopsch Schroeder 810 Cedar St, Michigan City Ind, No 389 Milton Robert Hillman, 200 Goffe Terrace, New Haven, Conn, No 390, Bessie Maybelle Copper, McDonald, Kans, No 391, Robert Gordon Hiler, 616 Church St, Ann Arbor, Mich, No 392, Louis Landau, 2718 Glendale Ave Detroit Mich

(*Motion No 71*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION

E F KELL, *Secretary*

## LETTER NO 24

July 6, 1936

*To the Members of the Council*

152 *Use of Text of N F* Motion No 70 (Council Letter No 23) has been carried and William Wood & Co, and W H Blome have been advised

"In response to the request contained in your letter of the 20th, it is recommended that permission be granted to P Blakiston's Son & Co, Inc, to use portions of the text of the N F VI for comment in the Second Edition of Muldoon's 'Text Book of Organic Chemistry' and that the customary fee of \$5 00 be charged for this grant "

"In response to the request contained in the letter of G A Bender of the N A R D it is recommended that permission be granted to the N A R D to use portions of the N F VI for comment in a revision of the booklet entitled 'Some Important U S P and N F Preparations' It is further recommended that no fee be charged for this grant "

(*Motion No 72*) It is moved by DuMez that P Blakiston's Son & Co and the National Association of Retail Druggists be granted permission to use the text of the N F VI in the second edition of Muldoon's "Text Book of Organic Chemistry" and in a revised edition of 'Some Important U S P and N F Preparations,' respectively, with the customary acknowledgment in each case, and the usual fee of \$5 00 in the first case

153 *Election of Members* Motion No 71 (Council Letter No 23) has been carried and applicants for membership numbered 361 to 392 inclusive, are declared elected

154 *Applicants for Membership* The following applications, properly endorsed and accompanied with the first year's dues, have been received

No 393, Carl W Noren, 2019 E Lake St, Minneapolis Minn, No 394 Samuel Isermann, 57 Wilkenson Ave Jersey City, N J, No 395 Elmer E Chilson, 294 Pearl St, Rochester, N Y, No 396 Frank S Houck, Gloversville, N Y, No 397, Arthur F Anderson, 16 S Main St, Minot, N Dak, No 398, Elder G Otis, Abercrombie, N Dak, No 399 John Whalen Langdon, N Dak, No 400, Erich Kather 212 Main St, Williston N Dak, No 401, S L Mark, 118 Fifth Ave So, Jamestown, N Dak, No 402, H F Easton, Crosby, N Dak, No 403 Geo J Holicky, 414 Main St, Breckenridge, Minn, No 404, Homer L Hill Towner, N Dak, No 405 Geo C Benno, 108 S Main St, Minot N Dak, No 406, Samuel M Dripps, 324 5th St Elizabeth, Pa, No 407, Richard A Rhone, 26 Edna Ave, Bradford Pa, No 408, Joseph Albert Meisner, 1069 Norwich Ave, Pittsburgh, Pa No 409, John Stanley McAleer, 5210 Gertrude St, Pittsburgh No 7, Pa, No 410 Isadore Browarsky, State St, Oakdale, Pa, No 411, Norman J Ilkuvitz, 553 Miller Ave, Clariton, Pa, No 412, Willard H Roberts, 230 Genesee St, Utica N Y, No 413, John Joseph Gill 5706 Harper Ave, Chicago, Ill, No 414 Charles F Boessel, 8616 Trafford Lane, St Louis, Mo, No 415, Paul Eric Sick, Calle Belgrano 3655 Buenos Aires Argentina, No 416, Henry J Gillen, 38 Fabyan St, Dorchester, Mass, No 417, Ella Lehrman,



15 Woolson St, Mattapan, Mass, No 418 Otto H Anderson, 87 Arlington St, Fitchburg Mass, No 419, Benjamin P Hecht, 70 Wildwood St Mattapan, Mass, No 420, Frank Shinopoulos 105 Pleasant St, Dorchester Mass, No 421, Clara D Herskowitz, 4900 Riestertown Rd, Baltimore Md, No 422, Loyd Debert Carroll, 1408 N Alabama St Indianapolis, Ind, No 423 Mary Nancy Pike 2 S Union St Concord, N Car, No 424 Ernest Royce Napa State Hospital Imola Calif No 425 Arthur R Cade 607 Fifth Ave, So, Minneapolis Minn No 426 Lorenz Harro Jensen, 1977 So Huron St, Denver Colo, No 427 Milton Laughland, 133 Sagamore Rd Apt 9\*B Tuckahoe N Y No 428, Noble C Earl c/o United Drug Co, Boston, Mass No 429 Charles L Pickens, 626 McDonough Blvd S E, Atlanta, Ga, No 430, Robert G Eberhard 15 E 40th St New York, N Y, No 431 H P Lundin, Watford City, No Dak, No 432 Cyp H Saunders Minot N Dak, No 433 Yeikuma Koba, Doshou machi 3 chome, Osaka Japan

(*Motion No 73*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION

155 *Use of Text of N F VI* The following letters have been received from Chairman DuMez of the Committee on Publications

"Inasmuch as Dr Henry Kraemer was granted permission to use portions of the text of the N F V for comment in his 'Text Book on Pharmacognosy,' it is recommended that permission be granted to Professors Gathercoal and Wirth to use portions of the text of the N F VI in the preparation of a textbook on pharmacognosy to be patterned after the one prepared by Dr Kraemer and that the customary fee of \$5 00 be charged "

Inasmuch as Lea and Febiger were granted permission to use portions of the text of the N F V for comment in 'Cushny's Pharmacology and Therapeutics,' it is recommended that permission be granted them to use portions of the text of the N F VI for the same purpose and that the customary fee of \$5 00 be charged for this purpose "

(*Motion No 74*) It is moved by DuMez that E N Gathercoal and E H Wirth and Lea and Febiger be granted permission to use portions of the text of the N F VI in a new textbook on Pharmacognosy and in a revision of Cushny's Pharmacology and Therapeutics by Edmunds respectively with the customary acknowledgment and at the usual fee of \$5 00 in each case

156 *Tentative General Program for the Eighty Fourth Annual Meeting* With the approval of President Costello, Local Secretary Adams and the Committee on Standard Program of the Council, the secretary submits the attached tentative general program Officials of the various affiliated organizations represented in the program have approved those features in which their respective organizations are directly interested

The changes suggested in the tentative program for the 1936 meeting are

(a) The meeting of the Council has been scheduled for Sunday

(b) The First Session of the Conference of Law Enforcement Officials has been scheduled for Monday evening August 24th at the request of the officers of the Conference

(*Motion No 75*) It is moved by Kelly that the tentative general program of the Eighty Fourth Annual Meeting be approved A vote on this motion will be called for in about one week

E F KELLY, Secretary

# GENERAL PROGRAM FOR THE EIGHTY-FOURTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AND AFFILIATED ORGANIZATIONS, HOTEL ADOLPHUS, DALLAS TEXAS, AUGUST 24-29, 1936

All dates included in special fare arrangements All meeting rooms for business sessions located on the Fifth and Sixth floors and are air-conditioned

AUGUST 17TH-21ST

Plant Science Seminar Program see A PH A JOURNAL, June page 568 Meetings will be held at the State Park and Game Preserve near Wilburton Okla

## SATURDAY, AUGUST 22ND

- 2 00 P M National Conference on Pharmaceutical Research—Ball Room  
 5 00 P M National Conference on Pharmaceutical Research—Ball Room

## SUNDAY, AUGUST 23RD

- 9 30 A M Council A P H A—Parlor D  
 8 00 P M American Council on Pharmaceutical Education—Parlor B

## MONDAY, AUGUST 24TH

- 9 00 A M N A B P—Ball Room  
 9 00 A M A A C P—Executive Committee—Parlor E  
 9 00 A M A A C P—Teachers' Conferences  
     Chemistry Conference—Ball Room  
     Pharmacy Conference—Texas Room  
     Pharmacognosy and Pharmacology Conference—Parlor A  
     Pharmaceutical Economics Conference—Parlor B  
 2 00 P M N A B P—Ball Room  
 2 00 P M A A C P—Texas Room  
 6 00 P M Dinner, N A B P—Palm Garden  
 6 00 P M Dinner, A A C P—Danish Room  
 8 00 P M A A C P—Texas Room  
 8 00 P M First Session Conference Law Enforcement Officials—Parlor A  
 10 00 P M Reception—(Informal) followed by dancing—Ball Room

## TUESDAY, AUGUST 25TH

- 9 00 A M Joint Meeting N A B P and A A C P—Ball Room  
 12 15 P M Luncheon, Committee on National Formulary—Parlor B  
 1 30 P M First Session, House of Delegates—Ball Room  
 2 30 P M N A B P—Ball Room  
 2 30 P M A A C P—Texas Room  
 6 30 P M Joint Banquet, A P H A and Related Organizations—Ball Room

## WEDNESDAY, AUGUST 26TH

- 9 00 A M First General Session, A P H A—Ball Room  
 12 15 P M Luncheon, Syllabus Committee—Parlor D  
 2 00 P M First Session, Scientific Section—Ball Room  
 2 00 P M First Session, Section on Education and Legislation—Texas Room  
 2 00 P M First Session, Section on Commercial Interests—Parlor A  
 2 00 P M First Session, Section on Historical Pharmacy—Parlor B  
 2 00 P M First Session, Conference of Pharm Asso Secretaries—Parlor C  
 3 00 P M Meeting Committee on Nominations—Parlor E  
 6 00 P M Dinner, Rho Chi Fraternity followed by Annual Convention—Danish Room  
 8 00 P M Second Session, House of Delegates—Ball Room

## THURSDAY, AUGUST 27TH

- 9 00 A M Council A P H A—Parlor D  
 9 00 A M Second Session, Section on Commercial Interests—Parlor A  
 9 00 A M Second Session, Scientific Section—Ball Room  
 9 00 A M First Session, Section on Practical Pharmacy & Dispensing—Parlor C  
 9 00 A M Second Session, Section on Historical Pharmacy—Parlor B  
 9 00 A M Second Session, Conference of Law Enforcement Officials—Texas Room  
 12 00 M Veteran Druggists' Luncheon—Palm Garden  
 2 00 P M Second General Session, A P H A—Ball Room  
 6 00 P M Dinner, Kappa Psi Fraternity and Lambda Kappa Sorority—Palm Garden  
 6 00 P M Dinner, Phi Delta Chi Fraternity—Danish Room

- 8 00 P M Joint Session, Scientific Section & Section on Practical Pharmacy and Dispensing—Ball Room
- 8 00 P M Joint Session, Section on Education and Legislation Conference of Pharmaceutical Law Enforcement Officials, and Conference of Pharmaceutical Association Secretaries—Texas Room
- 8 00 P M Meeting Committee on Resolutions—Parlor B

## FRIDAY AUGUST 28TH

- 9 00 A M Third Session Scientific Section—Ball Room
- 9 00 A M Second Session Section on Practical Pharmacy and Dispensing—Parlor C
- 9 00 A M Second Session, Section on Education and Legislation—Texas Room
- 9 00 A M Second Session Conference of Pharm Asso Secretaries—Parlor A
- 1 00 P M Meeting Committee on Resolutions—Parlor A
- 2 00 P M Final Session, House of Delegates—Ball Room
- 6 00 P M Dinner Former Presidents, A Ph A—Parlor A
- 6 00 P M Special Dinners
- 8 00 P M Final General Session A Ph A—Ball Room
- 10 00 P M Farewell Party—Ball Room
- 10 00 P M Council A Ph A—Parlor D

## SATURDAY, AUGUST 29TH

- 9 30 A M Entertainment—Arrangements to be announced later

## NOTICE FROM THE TRANSPORTATION COMMITTEE

Very favorable rates are in effect this summer from all parts of the United States and Canada to Dallas and return to the starting point on account of the Texas Centennial Exposition. In general round trip rates are about one and one third of the new low one way fares, and the tickets are good for thirty days. Also subject to the usual restrictions, diverse routes may be used for the going and returning journeys. These reduced rate tickets are on sale at all important railroad stations and their low cost is shown in the list below, giving the round trip rates for some widely scattered cities. These "first class" fares are for Pullman cars and the cost of berths or seats must be added to them. Up to the present time, we have been unable to secure the special rates from certain stations in the northeast and the far west, but we are assured that they are correspondingly low. All or nearly all Pullman cars on southern runs are air conditioned.

While we believe that these rates are correct their accuracy cannot be guaranteed. Coach fares are still lower than the following rates:

Albany N Y	\$67 25	Memphis Tenn	\$18 75
Asheville N C	40 90	Milwaukee, Wis	10 55
Atlanta Ga	33 55	Mobile Ala	25 10
Boston Mass	79 35	Montreal, Que	87 15
Buffalo N Y	61 85	New York N Y	67 25
Charleston S C	44 25	Omaha Nebraska	27 80
Chicago Ill	38 20	Pittsburgh Pa	56 05
Cincinnati, Ohio	38 75	Portland Me	87 05
Cleveland Ohio	54 05	Providence, R I	78 45
Columbus Ohio	45 95	Richmond Va	53 95
Denver Colo	33 25	St Louis Mo	26 70
Des Moines Ia	29 05	St Paul Minn	39 10
Detroit Mich	52 50	Salt Lake City, U	52 20
Indianapolis Ind	38 75	Toledo Ohio	49 40
Kansas City Mo	19 80	Toronto Ont	66 15
Louisville Ky	33 95	Washington, D C	56 05

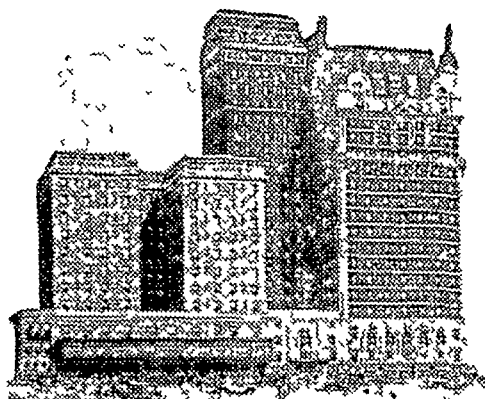
Information about the post convention tour through Southern Texas and Mexico to Mexico City, which is being arranged, may be obtained from Sam P Harben 512 Allen Building Dallas Texas

THEODORE J BRADLEY, *Chairman*, Committee on Transportation A P H A

## HOTEL ADOLPHUS—HEADQUARTERS

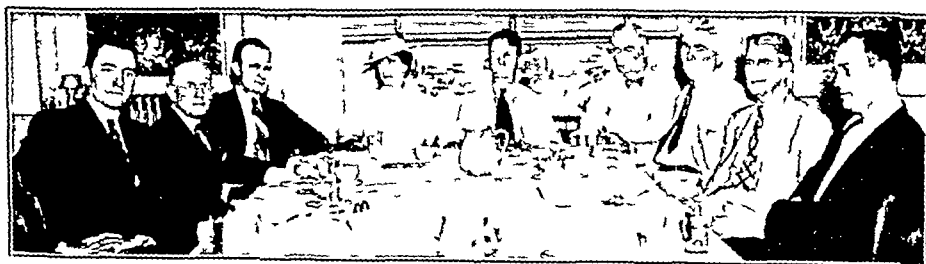
The meeting rooms to be used by the AMERICAN PHARMACEUTICAL ASSOCIATION are air-conditioned

The rates of a number of hotels are given, together with the number of rooms and the names of the managers. If you desire, make inquiry relative to air condition or other comforts



Hotel Adolphus

Hotel	Address	Rooms	Rates Single	Rates Double	Manager
Adolphus	Commerce Akard Main	825	\$2 50 to \$5 00	\$4 00 to \$7 00	H Fuller Stevens
Ambassador	1312 S Ervay	300	3 00 to 5 00	3 50 to 6 00	C A Sheffield
Baker	Commerce-Akard	700	2 50 to 5 00	4 00 to 7 00	Fenton J Baker
Bluebonnet	1302 Commerce	150	1 50 to 3 50	2 50 to 5 00	Dean Carpenter
Campbell	Elm Harwood	108	1 00 to 2 00	1 50 to 3 00	George C Scott
Ervington	Ervay & Pochontas	250	2 50 to 5 00	3 50 to 10 00	W D Reaves
Hilton	Main Harwood	320	1 50 to 3 00	2 50 to 6 00	C C Rank
Jefferson	Wood Jefferson Houston	450	1 50 to 6 00	2 50 to 8 00	Lawrence Mangold
Mayfair	723 N St Paul	150	1 50 to 2 50	2 50 to 4 00	Jack W Tucker
Sanger Apartments	Ervay at Canton	325	2 00 to 5 00	3 00 to 7 00	Mr & Mrs Ted Spreng
Southland	Main Murphy Commerce	250	1 50 to 3 00	3 00 to 5 00	Joe Hallaman
Texan	Jackson & Houston	60	1 50 to 2 50	2 50 to 4 00	C A & H W Russell
Whitmore	Commerce Martin	125	2 00 to 5 00	3 50 to 10 00	Curtis F Reach
Worth	1014 Main	75	1 00 to 2 00	1 50 to 3 50	T R Singletary



## CHAIRMEN, DALLAS A P H A CONVENTION COMMITTEES

Left to Right Membership Committee, B B Brown, Local Secretary, Walter D Adams, Reception Committee, H C Burroughs, Women's Auxiliary Committee, Mrs R M Walmsley, Convention Committee, E C Harrell, Treasurer W E Hill, N A B P Arrangements, W H Cousins V-C, Reception Committee, B E Hazard, Entertainment Committee, M H White

## A PH. A LOCAL BRANCHES

Secretaries will please report incorrections and elections  
Also render reports of meetings Thank you

### BALTIMORE

No fixed meeting night.

President A N Hewing  
1 vice President Chas S Austin Jr  
Secretary Treasurer Robert S Fuqua  
Chairmen of Committees Membership Gilbert  
Josephs Professional Relations Marvin J Andrews  
Science and Practice of Pharmacy Samuel L Fox  
Education and Legislation A G DuMez

### STUDENTS AUXILIARY MARYLAND UNIVERSITY SCHOOL OF PHARMACY

President P H Thompson  
First Vice President J R Karns  
Second Vice President W Gakenheimer  
Secretary S Glickman  
Treasurer R Thompson  
Editor R V Robinson  
Executive Committee A Tramer G A Mouat G  
Kelley M R Thompson Frank J Slama

### CHICAGO

Meet third Tuesday

President S W Morrison  
First Vice President H M Emig  
Second Vice President R A G Linke  
Third Vice President O U Sisson  
Secretary Treasurer L Templeton  
Delegate to the House of Delegates L Templeton  
Committee Chairmen Membership, Thomas F  
Rylands Legislation J Riemenschneider Practice  
I A Becker Medical Relations Dr Bernard Fantus  
Publicity A E Ormes

### CINCINNATI

Meet second Tuesday

President C W Sondern  
Vice President T H Rider  
Secretary R L Puls  
Treasurer John P Jennie  
Delegate to the House of Delegates A Ph A Frank  
H. Freericks  
Trustees C G Merrell (1937) B J Kotte (1936)  
Nicholas Blank (1935) Frank H Freericks (1934)  
Bertha M Ott (1933)

### DETROIT

Meet third Tuesday

President Berton Todd  
First Vice President Carl Novak  
Second Vice President Lawrence Mann  
Secretary Bernard A Bialk  
Treasurer Frederick F Ingram  
Student Council Hamilton Whitman and Florence  
Hartsoff U of M Henry Tyska and William Hen  
neay D I T Berton Todd and William Blatchley  
C C D Council of Clerks Robert Woonsocket U of  
M Douglas Robinson D I T James Lidell C C  
D Secretary Bernard A Bialk Treasurer Fred  
Ingram Chairman Program Committee R T Lakey

### NEW YORK

Meet second Monday

President Frederick C A Schaefer  
Vice President Otto F A Canis  
Secretary Horace T F Givens  
Treasurer Turner F Currens  
Delegate to the House of Delegates Hugo H Schaefer  
Secretary Remington Honor Medal Committee Hugo  
H Schaefer  
Chairmen of the Committees Education and Legisla  
tion Robert S Lehman Progress of Pharmacy  
Leonard W Steiger Professional Relations James  
H Kidder Audit Ernst A Bilhuber Membership  
Rudolf O Hauck

### NORTHERN NEW JERSEY

President George C Schicks  
Vice President Robert W Rodman  
Secretary C L Cox  
Treasurer A F Marquier

### NORTHERN OHIO

President Ellsworth Loesch  
Vice President F W Gehring  
Secretary Neil T Chamberlin  
Treasurer Herbert Decker

### NORTH PACIFIC

President Fred A Geue  
First Vice President George Haack

Second Vice President M Frederick Grill  
Secretary Treasurer Harvey J Donnell  
Chairmen of Committees Practical Pharmacy Harry  
Weis Professional Relations L G Haack Programs  
Earl Gunther Membership Frank Nau

### NORTHWESTERN

President R Almio  
Secretary Treasurer C V Neta

### PHILADELPHIA

President L L Miller  
First Vice President H Evert Kendig  
Second Vice President S H Kerlin  
Secretary Treasurer George E Byers  
Chairman of Committees Professional Relations  
W A Pearson Practical Pharmacy Ambrose Huns  
berger Membership S H Kerlin Entertainment  
Prof Adley B Nichols  
Delegate to the House of Delegates Ambrose Huns  
berger

### PITTSBURGH

Meet third Tuesday

President Edward C DeBone  
Vice President W Gordon Sleigh  
Secretary Treasurer Frank S McGinnis  
Delegate to the House of Delegates C Leonard  
O Connell

### UNIVERSITY OF CALIFORNIA STUDENT BRANCH

President John Doble  
Vice President Raymond R Guehring  
Secretary Elsie H Bennetts  
Treasurer Everett S Ostrom  
Student Council Representative Harold Rolph  
Hefner  
Student Director of Drug Garden Gled Al Popoff

### UNIVERSITY OF SOUTHERN CALIFORNIA STUDENT BRANCH

President Harold Miller  
Honorary President Albert Musick  
Vice President David Ostrom  
Secretary Masaru Masuoka  
Treasurer Ernest Yamaguchi  
Faculty Advisers Harold R Bowers and Alvah G  
Hall

### UNIVERSITY OF FLORIDA STUDENT BRANCH

President C Herbert Gilliland  
Vice President Robert L White  
Secretary Robert Gerald Goedhart  
Treasurer Paul Fehder

### UNIVERSITY OF NORTH CAROLINA STUDENT BRANCH

President L G Barefoot  
First Vice President D B Forrest  
Second Vice President C B Clark Jr  
Secretary Treasurer H M Dellinger

### STUDENT BRANCH PITTSBURGH COLLEGE OF PHARMACY

President Joseph A Meissner  
Vice President Chester A Krause  
Secretary Wm B Strothman  
Treasurer Wilbur B Grove

### SOUTH DAKOTA STATE COLLEGE STUDENT BRANCH

President Frederick J Ahlfs  
Vice President Stanford Maresh  
Secretary Eugene C Kuske  
Treasurer Charles F Buck

### STUDENT BRANCH STATE COLLEGE OF WASHINGTON

President Leonard Zagelow  
First Vice President Ted Stahlborn  
Second Vice President Gail Howard  
Secretary Treasurer Belle Wenz  
Reporter Harold Freed

### ST. JOHN'S UNIVERSITY STUDENT BRANCH

President Saul Asms  
Vice President Isidore J Berman  
Treasurer John E Graziano  
Secretary Isabelle Seissman

### UNIVERSITY OF WISCONSIN STUDENT BRANCH

President George Vosmek Antigo  
Vice President George I Schefelker Stoughton  
Secretary Norman Glander Manitowoc  
Treasurer Arnie Stensby Stoughton  
Adviser Edward J Ireland

### OKLAHOMA UNIVERSITY PHARMACEUTICAL ASSOCIATION

Meet every Friday morning at 10 00 o'clock during  
the school year  
President Bill Cates Atoka

Honorary President Val Adams Oklahoma City  
 Vice President Frank Ozment Jr Talihina  
 Secretary Katherine Searle Redrock  
 Treasurer Jerry Gwin Ada  
 Chairman of the Program Committee J Pat Henry  
 Ringling  
 Chairman of the Committee on Public Relations, E E  
 Parsons Okemah  
 Chairman of the Committee on Sports Gene McGill  
 Alva

LOUISVILLE COLLEGE OF PHARMACY STUDENT BRANCH  
 President William J Walsh  
 Vice President Fred P Kranz Jr  
 Secretary, Joe Black  
 Treasurer John M Burton

Faculty Adviser Dean G L Curry  
 Program Committee Chairman Horace Hannon  
 Sister Crescentia Wise Henry J Zur Lage  
 Student Activities Committee Chairman Claude M  
 Lloyd Sister Margaret Ann Schwering Edward E  
 Krebs  
 Membership Committee Chairman Fred P Kranz  
 Jr Hal F Acuff Joe P Forgy Jr

#### UNIVERSITY OF MISSISSIPPI STUDENT BRANCH

President J W Duckworth  
 Vice President Tony Rosetti  
 Secretary J M Longmire  
 Treasurer W J Hossley Jr  
 Faculty Adviser Prof W W Johnson

## PRELIMINARY REPORT OF THE COMMITTEE TO STUDY THE BY-LAWS OF THE ASSOCIATION

Subsequent to the annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION at Portland, President Costello appointed a Committee to Study the Constitution and By Laws as such a group was recommended by the Portland convention, and grew out of certain recommendations made by Doctor Robert P Fischelis in his presidential address

The Committee was requested to apprise the membership in advance of the annual meeting of the changes proposed

The recommendations in the address of President Fischelis, which were referred to the Committee for study, read as follows

### Recommendations Nos 2, 5 and 13

(2) It is recommended that the secretary of the ASSOCIATION be also designated as general manager, and that this title shall carry with it executive supervision of and responsibility for the activities of the ASSOCIATION in the headquarters building

(5) It is recommended that the president elect be made an ex-officio member of the Council immediately following his election, and that the procedure at the annual convention be so arranged as to give the president-elect an opportunity to submit recommendations in time for approval at the meeting at which he takes office

(13) It is recommended that the By-Laws be amended to reduce membership of the Council to six elected members and three ex officio members namely The President, the President-Elect and the Chairman of the House of Delegates The six elected members should be distributed geographically in accordance with the concentration of membership

In this connection, it will also be recalled that Robert L Swain, in his presidential address the year preceding recommended that the number of nominees for the presidency of the ASSOCIATION, as well as the number nominated for first vice president and second vice-president, be reduced from three to two, and that the immediate past-president serve as an ex officio member of the Council for the year following his term of office

These recommendations have been met in the following proposed changes in the By-Laws Omitted words are in parenthesis, and newly added words are underlined

## CHAPTER I

### ELECTION OF OFFICERS AND MEMBERS OF THE COUNCIL

Article I Nomination of President, Vice Presidents and Councilors The House of Delegates shall at its second session, held during the annual meeting of the ASSOCIATION, nominate by ballot (three) two candidates, one of whom shall be, as hereinafter provided elected President to serve for one year, (three) two candidates for First Vice-President, one of whom shall be elected for one year, (three) two candidates for Second Vice-President, one of whom shall be elected for one year, and nine candidates, three of whom shall be, as hereinafter provided, elected members of the Council to serve for three years

*The Council is empowered and directed to fill all vacancies in the list of nominees, which occur by death or resignation after the adjournment of the annual meeting of the Association and prior to the issuance of mail ballots*

## CHAPTER II

Article I President Last line of Article I shall read as follows He shall be (an ex officio) a member of the Council

The following sentence is added to Article III

*The Secretary shall also serve as General Manager of the Association, and shall have executive supervision over its activities including direction of and responsibility for the headquarters building and the activities of the Association carried on therein*

## CHAPTER III

## COUNCIL

Article I Membership The Council shall consist of (17) 19 members, each of whom has held membership in the ASSOCIATION for five years or more and (no one of whom is an officer of the House of Delegates) elected as hereinbefore provided The (President), *the immediate Past President the President Elect*, the Vice-Presidents the Chairman of the House of Delegates the Editor of the JOURNAL the Editor of the YEAR BOOK, the Secretary and Treasurer of the ASSOCIATION shall be ex officio members of the Council The elected members of the Council shall serve until their successors have been installed

*Within 30 days following the annual meeting of the Association the Secretary shall call upon the Council to elect by Mail Ballot, three members of the Council, to be chosen from the nine elected members, who, with the Chairman of the Council and the President of the Association, shall constitute an Executive Committee of the Council The Executive Committee shall confer with the Secretary upon his request, and shall advise with him upon all matters having to do with the affairs and activities of the Association In all cases however, the conclusion of the Executive Committee, together with an abstract of its proceedings shall be submitted to the Council by mail for ratification or rejection upon majority vote of the members*

## CHAPTER VII

LOCAL BRANCHES *and Student Branches*

## CHAPTER VIII

Article I Standing Committees

- 1 Committee on Local *and Student Branches*
- 12 *Committee on Pharmacy Week*
- 13 *Committee on the Status of Pharmacists in the Government Services*

The Committee secured legal advice that the Articles of Incorporation did not limit the number of members of the Council

ROBERT L. SWAIN, *Chairman*

## A PH A RESEARCH AWARD

The AMERICAN PHARMACEUTICAL ASSOCIATION announces the award of a grant totaling \$1000 00 which will be available on October 1, 1936 for research in medicinal substances In making the announcement, Chairman H V Army, of the Committee on Research of the A PH A requests those desiring aid to write him at 115 W 68th St New York City before August 5th, giving name and laboratory connections outline of research in contemplation and amount of grant requested

Dr Army points out that present plans call for publication in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION of the paper describing the results of the research

## THE ADVANCEMENT OF SCIENCE

Special endowment funds give the American Association for the Advancement of Science a limited income which, in accordance with the conditions of the donors may be used in making small grants to individuals for encouragement in research Special blanks may be secured from the office of the permanent secretary Smithsonian Institution Building Washington, D C on which those who desire may make application It is essential that there be at least two sponsors who are able to speak both of the applicant and of the project from personal acquaintance and are qualified to pass upon the work and the proposed utilization of the grant

# EDITORIAL NOTES

## OLD TEXAS MISSIONS

Second only to the Alamo as a sacred shrine of Texas martyrdom is the old mission of La Bahia del Espiritu Santo, popularly known as the Mission of Goliad, near the city of Goliad. Here Fannin and his men were held prisoners before their massacre by order of the Dictator, Santa Anna, on March 27, 1836. During Spanish colonial days a presidio or garrison of soldiers was maintained here. Originally located on Matagorda Bay, the mission and presidio were transferred inland to the present site on the San Antonio River about the middle of the eighteenth century.

San Jose Mission at San Antonio generally is recognized as the finest example of Franciscan mission architecture to be found in the present limits of the United States. Its famous rose window has been the subject of song and legend for many generations. Extensive restoration of the entire mission compound as it was originally laid out by the missionary fathers has been made possible in recent years through Public Works Administration grants.

## MEXICAN HIGHWAY

How important in the Texas program of economic and social development really is the construction of a Mexican highway system, is something that is hard to appreciate fully. It is mentioned here because some of our members contemplate a trip to Mexico City.

## THE ARMY MEDICAL LIBRARY

The Army Medical Library has celebrated its Centennial. It began with a small collection of books placed in the office of Surgeon General Lovell and has now grown to be the largest Medical Library in the world. The beginning of the Library was prompted by Dr. John Shaw Billings because in the writing of his thesis he was unable to find the required references in any one library and it was necessary for him to consult the libraries of various sections of the country. The space occupied by the Army Medical Library, in Washington, during its early years, was so small that in opening cases of books it was necessary to take them outside of the building.

The Library now has nearly 450,000 volumes.

## EXHIBIT OF BOOKS

A collection of books relating to the history of the medical sciences was on exhibit in the Lima Library, Catholic University, and was open to the public for a week. Among the books are "The Drugs and Spices of India," by Garcia da Orta, printed in Goa, India, in 1563. This volume, written in Portuguese contains one of the earliest descriptions of cholera and its remedy, and through it Europe learned of the plants and botany of the East.

Other books include "A Natural History of Brazil," by William Tiso and George Marcgraf, printed in Amsterdam in 1648, which for over a century was one of the principal scientific works on Brazil, and "History, Natural and Moral of the Indies," by Joseph Acosta, S. J., also a treatise on the pestilence of Pernambuco by John Sarreyra & Rosa, containing one of the first descriptions of yellow fever known in Europe, printed in Lisbon in 1694.

## SOCIAL ASPECTS OF SICKNESS

The Committee on Legislative Activities of the American Medical Association, which is headed by Dr. E. H. Cary, has recently authorized a release to the presidents and secretaries of State associations and delegates to the American Medical Association in which it stresses the desirability of less discussion of the topic "Medical Economics" and more emphasis upon "Social Aspects of Sickness."

## MEDICINE AND MACHINERY

"To day we are witnessing the apotheosis of the machine in human life and it is not surprising to find that medicine, like other spheres of action, is being mechanized. The public has come to believe that machinery is revolutionizing the healing art and is dispensing with the need for human judgment. It is true that the introduction of instruments of precision into medicine has been of great service but the interpretation of the results obtained by them in the individual case still demands wisdom and experience on the part of the doctor. Where the machine is greater than the man the patient perishes. A large section of the public does not understand this. It has such an incorrigible love for apparatus



and what it produces that it hailed with acclamation a box of gadgets constructed in defiance of all scientific principles which claimed to hand out an exact diagnosis and even the appropriate treatment, and thus make the application of so fallible a thing as the human mind unnecessary. Failing the reduction of medicine to machinery the public seeks salvation in the specialist and the expert, and the more apparatus and the more complicated, employed by these the greater its confidence"—LORD HORDER "The Clinician's Function in Medicine" *New York State J Med* 36 843 (June 1 1936)—*Journal A M A*

### KILMER MEMORIAL

A section of timberland in the Blue Ridge Mountains near the western tip of North Carolina will be dedicated on July 30th as the Joyce Kilmer Memorial Forest in honor of the soldier-poet of the 165th Infantry who was killed in the Battle of the Ourcq on that date in 1918.

The bronze tablet prepared for the dedication will bear the following inscription:

Joyce Kilmer, 165th Infantry, Rainbow Division soldier and poet author of 'Trees' born in New Brunswick, N J Dec 6 1886 killed in action in France July 30, 1918.

This memorial was initiated by the Bozeman Bulger Post, Veterans of Foreign Wars and was selected by the United States Forest Service.

The poet was a son of our esteemed member the late F B Kilmer.

### WASHINGTON RESEARCH CENTER

Dr L R Thompson Assistant Surgeon General of the Public Health Service in charge of the scientific research division announced the contemplated work at Bethesda Md. Under the new establishment research activities will be carried on at Bethesda in conjunction with a training school for medical officers classes for medical students postgraduate courses for advanced physicians and public health officers and an international information exchange which will attract public health leaders here from all over the world.

The Public Health Service whose responsibilities and potentialities have been doubled by the Social Security Act will have made a great stride forward when the Bethesda project is completed and functioning. Dr Thompson believes. With Dr Thomas Parran at the

helm the Public Health Service is in the midst of the most extensive program since its establishment.

### LINDBERGH ARTIFICIAL HEART DEVICE

Charles A Lindbergh and Dr Alexis Carrel will demonstrate their artificial heart apparatus to the scientific congress meeting in Copenhagen, August 10th. The Lindbergh pump, an artificial heart and lungs combined, permits such organs as spleens hearts kidneys thyroids and ovaries to be revived and kept alive indefinitely. Previous attempts had resulted in only temporary success, because infection had cut short the after life of the organs.

### MENINGITIS VACCINE

The boys in a CCC camp in Missouri served as test tubes for the immunization against meningitis. Three hundred and ninety five persons were vaccinated. Captain Kulms in reporting on the work in the *Journal of the American Medical Association* cautions against too enthusiastic reception for the vaccine. This is only a preliminary report.

### THE DROUGHT SECTION

Many of our fellow members are suffering as a result of the drought, the locusts and other unfortunate conditions. Sympathy and encouragement can be expressed to them and hope that better things may come to them, these good people have endured their suffering with courage. Losses have come to the citizens of other sections from floods, the year seems to carry an unusual record of disasters.

Dr Irvin Lavine professor of chemical engineering at the University of North Dakota has reported on the sodium sulphate deposits and Secretary M O Ryan of the State Planning Board is studying the economic problem. Wherever resources may be developed it is hoped that the losses will in a measure be made up by successful ventures.

### PROTAMINE INSULIN

'The advantages of protamine insulin over ordinary insulin in the treatment of certain cases of diabetes were proclaimed by one of the co-discoverers of insulin Prof C H Best of the University of Toronto at the meeting of the Canadian Medical Association at Vancouver.

The new kind of insulin was developed by Danish scientists. It was not intended to

supplant ordinary insulin in cases of diabetes which can be satisfactorily controlled by insulin alone, but was found a valuable adjunct to insulin in treating cases of severe diabetes. Protamine insulin is relatively insoluble and tends to be absorbed slowly and over a longer period of time than ordinary insulin. Consequently its blood sugar lowering effect lasts longer—twice as long, in fact.

'The work of the Danish group on protamine insulin has been abundantly confirmed,'" Dr Best said, "Various groups of clinicians in Boston, Toronto, London and Rochester, Minn.,

have found that the duration of insulin action is much extended when insulin is combined under appropriate conditions with protamine ' '

"Dr Best and his associate Dr Robert Kerr, found that dogs having no insulin-producing pancreas tissue could be kept free from symptoms of diabetes by one injection of protamine insulin daily. At least two injections of regular insulin are needed to accomplish this result. The fluctuations observed in the amount of sugar in the blood when regular insulin is used are avoided with protamine insulin"—*Science News Letter*, July 4, 1936

#### SECTION N—MEDICAL SCIENCES SECTION N<sub>2</sub>—PHARMACY \*

The subsection on Pharmacy held one session on Thursday morning at which John C. Krantz, Jr. (University of Maryland) presided. Marvin R. Thompson (University of Maryland) reviewed the pharmacology of the alkaloids of ergot. He pointed out the differences between the new alkaloid of ergot which is now called ergonovine and other alkaloids of ergot of the ergotovine, ergotamine group. He emphasized that the colorimetric reaction for the evaluation of ergot used in the British Pharmacopœia estimates all of the alkaloids whereas the new alkaloid, ergonovine, differs quite markedly pharmacologically from the alkaloids of the ergotoxine, ergotamine group.

H. B. Haag (Medical College of Virginia) discussed the assay of digitalis using the pigeon as the test object. The method did not employ the minimum emetic dose as was employed by Hanzlik and others but on the other hand he showed that the toxic dose is a trustworthy guide to the potency of digitalis when the pigeon is used as a test object.

Heber W. Youngken (Massachusetts College of Pharmacy) gave a detailed description of the pharmacognostic methods of differentiating between the anterior lobe of the pituitary body and the posterior lobe of the pituitary body as these substances appear on the drug market to be used for medication.

F. K. Riggs (Rutgers University) discussed the assay of Vitamin B<sub>1</sub> and pointed out that more specific methods than rat growth were necessary. He also emphasized that an absorbate of Vitamin B<sub>1</sub> on international clay was not as valuable as crude yeast and other products that contain B<sub>1</sub> in the restoration of rats that have been placed upon a Vitamin B<sub>1</sub> deficiency diet.

L. F. Tice (Philadelphia College of Pharmacy and Science) discussed the colloid chemistry of the two types of gelatin: the acid-treated type and the lime-treated type. He showed that their isoelectric points were different and that for all scientific work for which these gelatins were employed, particularly for the suspensions of the halides of silver, it was necessary to point out which gelatin had been employed.

Ruth Musser (University of Maryland) reported a study of the use of cyanides on the rat sarcoma, antidoting the rat against 3 lethal doses of cyanide by the Chen antidote. It was shown that the antidote of sodium nitrite and sodium thiosulphate not only antidotes the rat but also protects the viability of the tumor.

C. Jelleff Carr (University of Maryland) reported his studies on the use of dextrose fragments as a sugar substitute in diabetes. Animal experiments indicated that this substance bids fair to be a useful substitute carbohydrate in the diabetic diet.

William F. Reindollar (Maryland State Department of Health) presented a paper explaining a new method used for the titration of iodide and iodine as they occur in common solution in many of the United States Pharmacopœia preparations.

E. I. Evans (University of Chicago) discussed the emetic doses of extract of ergot, ergotoxine and ergonovine. He showed that ergonovine produced no emesis clinically as does ergotoxine. The meeting was closed by a paper by Richard A. Deno (Medical College of Virginia) presenting an elaborate histological study of the involution of the mouse uterus.

\* Held at University of Rochester June 18, 1936

## PERSONAL AND NEWS ITEMS

Dr Harrison E Howe indicates that there is a shortage in science teachers. He states that the demand is for the best trained men and for the best qualified chemists.

Josiah K Lilly is the founder of Foster Hall, and other Foster memorials, the last of which has been erected on the cathedral triangle Pittsburgh University campus. This foundation enlarges the aims of Mr Lilly. The inauguration of the annual Foster Song Week" will be featured in the public and private schools, theatres and clubs of the nation. A fund is to be created which will be used solely for the benefit of needy musicians of unquestioned ability. The third promotion is a renaissance in singing of the American people.

Dean Charles F Heebner, of Ontario College of Pharmacy, was honored by the presentation of an oil painting. Greetings were sent by pharmaceutical organizations and schools. Addresses were made by President H J Cody of the University of Toronto, the Minister of Health J A Faulkner, the graduates, alumni association and representatives of other bodies. Dean Heebner came to Ontario College of Pharmacy in 1891 and is a Life Member of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Gleb A Popoff, student director of Drug Garden AMERICAN PHARMACEUTICAL ASSOCIATION, University of California College of Pharmacy, San Francisco, has prepared a compilation of Plant Names with derivation and meaning of botanical names of medicinal plants. The purpose is assistance to the student of pharmacognosy; it has 52 pages neatly manifolded. The arrangement is that of Youngken's Text Book of Pharmacognosy, and some of the material is compiled from Kraemer, Culbreath, Trelease, Liddell, Scott and Andrews. The book is not for sale; it is compiled expressly for the pharmacognosy class of the University of California College of Pharmacy and maintains University form and reflects credit.

George H P Lichthardt, fellow member, is senior chemist for California State Highway Commission. He is a graduate in pharmacy; later, he took up the study of law and was admitted to the Bar.

Prof Charles H Rogers has been elected Dean of the College of Pharmacy of the University of Minnesota to succeed Dr Frederick

J Wulling, who has retired after long years of service.

Dean A G DuMez has been appointed a member of the Committee of the International Pharmaceutical Federation. In addition other members of the Committee of the Federation include

Dr A Chalmers of the University of Madrid, W van der Vorst, of the Nationale Pharmaceutique de Belgique, Dr A Schmieder, of the Deutsche Apothekerschaft, Dr A Jermstad, of the Norsk Pharmaceutisk, A Ovon Kotsansky, of the Ungarische Apotheker Verein, and Dr T Potjewidj of Leyden, Belgium. *Secretary*

James C Munch presented a paper before American Association for the Advancement of Science in Rochester on the use of pancreas extract from which all insulin had been removed for the treatment of *Angina pectoris*. Five hundred cases had been treated successfully in 85 per cent of 500 cases, and in 400 cases of high blood pressure, with good results.

Frank L Connors, prominent druggist of Montreal and *Second Vice President* of the Quebec Pharmaceutical Association, has been appointed Minister without portfolio in the new Quebec Cabinet.

Rhode Island physicians here have expressed their appreciation of service provided by Providence and Cranston pharmacies whose stores are stations where physicians may leave specimens for examination. Cooperating drug stores are E P Anthony, Blanding & Blanding, J E Breman & Co, First Aid Drug Store, Fleishman's Pharmacy, Gardner Drug Co, Haeseler Laboratory, Mason's Pharmacy, Professional Pharmacy and Walter R Thorpe.

Dr R Bienfang, in reporting on positions secured by this year's graduates in pharmacy, declared that nine of the 1936 graduates have secured appointments as pharmacists in Oklahoma drug stores.

Dr Joseph A O'Hara, president of the Louisiana Department of Health, said no action would be taken for some time after August 1st for failure of manufacturers to register, although we shall expect a response from the manufacturers whom we address on the subject." Dr O'Hara said it probably would be about the first of January 1937 before his department could take any action against manufacturers for failing to comply.

## OBITUARY

## DEATH OF SIR HENRY S. WELLCOME

It is with profound regret that we announce the demise of Sir Henry S. Wellcome in London on July 25th, aged 83 years. He was elected a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1875. The news of his death came too late for including a biographical sketch in this issue of the JOURNAL, in the meantime may we refer to the April JOURNAL for 1934, page 285, and to the succeeding issue, page 491. A distinguished citizen of the world and outstanding pharmacist has ceased his labors. A biography and tribute will appear in the August number of the JOURNAL.

## W. BRUCE PHILIP

Waldemar Bruce Philip, 80th president of the AMERICAN PHARMACEUTICAL ASSOCIATION died in San Francisco July 13th, aged 58 years, following an illness during the greater part of a year. Several months ago Mr. and Mrs. Philip returned to California hoping to come back to Washington after the former's restoration to health. However it was otherwise decreed and the members of the ASSOCIATION are saddened by the passing of one of their



W. BRUCE PHILIP

associates, who was always ready to serve in the interests of pharmacy, and they sympathize with the widow and other members of the bereaved family.

As president, Mr. Philip presided at the Madison Meeting and shared with Chairman S. L. Hilton in the concluding ceremonies, on May 9, 1934, at the closing of the corner stone of the AMERICAN INSTITUTE OF PHARMACY.

Waldemar Bruce Philip was born in Sacramento, Calif., July 19, 1878. His mother died

when he was three years old and Bruce was placed in care of a friend of the family until nine years later his father remarried.

The youth attended the grammar and high schools of Sacramento and during part of this period Bruce had a carrier's route for the daily *Sacramento Record Union*, his contact with the family of Dr. C. A. Miller had instilled the desire to become a druggist and secure a college education. He engaged with O. P. Willis, and later with George Munroe at Fresno. The contact with the personnel of this pharmacy and its patrons influenced the ideals of the young man. He had saved enough money to begin his college studies and secured a position with Dr. Albert L. Stoll in San Francisco and matriculated at the San Francisco College of Pharmacy. He registered as pharmacist and returned to San Francisco engaging with his former employer, O. P. Willis now Willis and Martin and after a year as employee he became a partner in the pharmacy.

In 1903, Mr. Philip entered for the "Doctor of Pharmacy" course in New York College of Pharmacy and after conclusion of the work, returned to the Sacramento pharmacy. On November 24, 1904, he married Miss Fayette Harris, a classmate at the California College of Pharmacy. February following, the firm of Philip and Philip established a pharmacy in Fruitvale, later two branch stores were opened these were disposed of but ownership of the buildings was retained. The Alameda County Association and San Francisco Retail Druggists' Association were organized at Mr. Philip's suggestion and these have functioned in the interests of the members and benefit of pharmacists in other sections of the State and country.

The Hastings College of Law of the University of California was organized in 1920. Mr. Philip matriculated and was admitted to the bar in 1923. He lectured and instructed in commercial pharmacy and pharmacy laws at the University for a decade. He was elected

Grand Regent of Kappa Psi Pharmaceutical Society and served in that capacity for a number of terms. *The Mask* of April 1931, gave an interesting and comprehensive account of the services rendered in pharmaceutical organizations and for pharmacy, a sketch also appears in the *JOURNAL A PH A* of January 1932. References are made to these activities as president of the Alameda County Pharmaceutical Association as chairman of its legislative and executive committees as secretary of the latter and also of the Retail Druggists of San Francisco. He suggested the students' loan funds of the latter. He is a former president of San Francisco Secretaries' Club member of several alumni organizations. Philadelphia College of Pharmacy and Science honored him with the Ph M degree and the National University Washington conferred on him the degree of Master of Law.

The deceased was a member of the Board of Trustees U S P XI. He served as chairman of the House of Delegates A PH A vice chairman of the Council, A PH A and member of important committees.

He was vice president of the National Association of Retail Druggists member of important committees and for a number of years its Counsel and Washington representative. He published a *Bulletin* dealing with pharmaceutical legislation and other topics relating to pharmacy and the drug trade activities.

The funeral ceremonies of the deceased were attended by representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION, the National Association of Retail Druggists, Veteran Druggists Association, California State Pharmaceutical Association, Northern California Retail Druggists' Association, Southern California Retail Druggists Association, Kappa Psi Fraternity, California College of Pharmacy, Attorneys and Drug Clerks' Associations. Dr Franklin T. Green and John Culley were pall bearers.

#### JOHN URI LLOYD MEMORIAL ISSUE

The *Eclectic Medical Journal* for May is a memorial issue. The first article is that of the publication—a comprehensive biographical sketch, other tributes have been selected. The biographical sketches include the following: 'A Character Sketch' by Adolph G. Vogeler. 'John Uri Lloyd Pharmacal Pathfinder' by Russell Manning. 'Ohio Eclectic Honor John Uri Lloyd' Introduction Remarks by Byron H. Nellans M D. 'John Uri Lloyd—the Author' by William P. Best

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#### A W POOLE

A W. Poole, pharmacist at Clarendon, Va. died July 9th aged 61 years. After graduation from George Washington University in 1900 Mr. Poole entered the drug business in Georgetown, where he remained for 33 years. Three years ago he moved his business to Arlington County, where he made his home.

Arthur Amos Noyes former Director of the Gas Chemical Laboratory, at the California Institute of Technology, died June 3rd. Dr. Noyes received the Willard Gibbs Medal in 1927 and the Davy Medal in 1932. He was president of the American Chemical Society in 1904.

Mrs. Leslie V. Caspari, widow of the late Professor Charles Caspari, died July 16th, aged 91 years. Members and all other pharmacists will remember the late Charles Caspari who was active for many years in the Association. Mrs. Caspari was the mother of Dr. Charles I. Caspari, Dean of the St. Louis College of Pharmacy.

#### ANNUAL REPORT ON TRAFFIC IN NARCOTICS

According to the report of the Commissioner of the Bureau of Narcotics \$241,800,000 was appropriated for the enforcement of the Federal Narcotic Laws for the fiscal year 1935. A uniform narcotic law has been approved by the National Conference of Commissioners of Uniform State Laws.

## SOCIETIES AND COLLEGES

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1936-1937

*President Elect*, George D Beal Pittsburgh, Pa

*First Vice President Elect*, J Leon Lascoff, New York, N Y

*Second Vice President Elect*, James C Munch, Lansdowne Pa

*Members Elect of the Council* H C Christensen, Chicago, Ill, R P Fischels, Trenton N J, Ernest Little, Newark, N J

These officers will be installed at the annual meeting of the Association in Dallas, Texas

## NORTH PACIFIC BRANCH A P H A

Immediately following reports by Dean A Ziesle secretary of the O S P A educational fund, and Dean A O Mickelsen, chairman of the Pharmacy Week committee, the North Pacific Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION will present the following program under the direction of President Fred Geue 'Changes and Revision of U S P and N F ' by Professor E T Stuhr of Oregon State College, 'White Mineral Oil and Petroleum in Pharmacy,' by Dean A O Mickelsen of North Pacific College, followed by comments on mineral oil by L B Benjamin

AMERICAN CHEMICAL SOCIETY  
ANNIVERSARY

The sixtieth anniversary of the American Chemical Society will be celebrated at a 5 day national meeting in Pittsburgh beginning September 7th

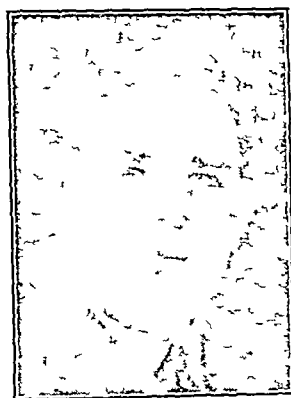
SOCIETY FOR THE HISTORY OF  
PHARMACY

The meeting of the Society for the History of Pharmacy was held in Stuttgart Germany June 16th to 18th, this also represents the 10th anniversary of the organization

Dr Häfliger, the president of the organization presided In his address he referred to the activities of the Association during the ten years and the results which followed He complimented the work of Dr Fritz Ferchl

Dr O Zeckart referred to the work of Karl Wilhelm Scheele Dr George Edmund Dann delivered an address in which he gave a comprehensive genealogy of the apothecary and chemist Martin Heinrich Klaproth It is

interesting to note that two members of the family, namely the one referred to, and Julius Klaproth, were outstanding in their respective fields—the former as chemist and the latter as orientalist



SAM P HARBEN  
Chairman Texas Post-Conven-  
tion Tours

AMERICAN PHARMACEUTICAL ASSOCIATION  
meets in Dallas August 24th-29th

## TAMPA HEALTH COUNCIL

E P Purcell president of the Hillsborough County Retail Druggists' Association, was elected *President* of the newly organized Hillsborough County Allied Health Council comprising a membership of doctors dentists nurses and druggists Other officers elected were Dr T Rector, *First Vice President*, Dr C J Caraballo *Second Vice President*, Mrs Maud Darlington *Secretary and Treasurer*

## ILLINOIS FAIR TRADE ACT

The Illinois Supreme Court has handed down a decision upholding the constitutionality of the Illinois Fair Trade Act in the case of *Trner vs McNeil* Quoting *C R D A News*

Fair Trade Legislation resting as it does upon a sound equitable commercial and legal foundation namely that one or a small group cannot so conduct themselves as to injure a great majority must in the course of human progress adjust itself so that its benefits will be for the greater good of the greatest number '

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anniversary of the organization

Dr Häfliger the president of the organiza-  
tion, presided In his address he referred to  
the activities of the Association during the  
ten years and the results which followed He  
complimented the work of Dr Fritz Ferchl

Dr O Zeckart referred to the work of Karl  
Wilhelm Scheele Dr George Edmund Dann  
delivered an address in which he gave a com-  
prehensive genealogy of the apothecary and  
chemist Martin Heinrich Klaproth It is

interesting to note that two members of the  
family, namely the one referred to, and Julius  
Klaproth, were outstanding in their respective  
fields—the former as chemist and the latter  
as orientalist



SAM P HARBEN  
Chairman, Texas Post-Conven-  
tion Tours

AMERICAN PHARMACEUTICAL ASSOCIATION  
meets in Dallas, August 24th-29th

## TAMPA HEALTH COUNCIL

E P Purcell president of the Hillsborough  
County Retail Druggists' Association, was  
elected *President* of the newly organized Hills  
borough County Allied Health Council com-  
prising a membership of doctors dentists  
nurses and druggists Other officers elected  
were Dr T Rector, *First Vice President*, Dr  
C J Caraballo *Second Vice President*, Mrs  
Maud Darlington *Secretary and Treasurer*

## ILLINOIS FAIR TRADE ACT

The Illinois Supreme Court has handed down  
a decision upholding the constitutionality of  
the Illinois Fair Trade Act in the case of Triner  
vs McNeil Quoting C R D A News

Fair Trade Legislation resting as it does upon  
a sound equitable commercial and legal founda-  
tion namely that one or a small group cannot  
so conduct themselves as to injure a great  
majority, must in the course of human progress  
adjust itself so that its benefits will be for the  
greater good of the greatest number



### BRITISH PHARMACEUTICAL CONFERENCE

The 73rd annual meeting of the British Pharmaceutical Conference was held at Bournemouth during the week of June 23rd. The annual address was presented by Chairman Harold Deane. Twenty-two conference papers were presented and discussed, dealing with pharmaceutical subjects relating to British pharmacy.

### CONNECTICUT BOARD OF PHARMACY

William J Dunphy succeeds Edward J Murphy as president of the Connecticut Board of Pharmacy Commissioners and Hugh P Beirne was reelected secretary-treasurer. Other members are George Blackall and Edward J Murphy.

### DELAWARE PHARMACEUTICAL SOCIETY

The fiftieth annual meeting of the Delaware Pharmaceutical Society was held at the Hotel Belhaven Rehoboth Beach, June 29th and 30th. Dr Marvin J Andrews, professor of pharmacy of The School of Pharmacy University of Maryland, spoke on "U S P and N F Propaganda to the Physician" with special reference to the new admissions. Dr Robert L Swain spoke on "Fair Trade Laws in General and Operation of Pharmacy Law in Maryland." Thomas Donaldson, chairman of Legislative Committee, gave an historical sketch of Delaware Pharmaceutical Society. Motion passed that a letter of thanks be sent Secretary E F Kelly of the AMERICAN PHARMACEUTICAL ASSOCIATION for his untiring efforts and splendid work in helping the pharmacist to become recognized in the U S Army.

The following officers were elected: *President*, Edward J Elliott, Bridgeville; *First Vice President*, Frank E Brereton, Milford; *Second Vice President*, Peter Paul Potocki, Wilmington; *Third Vice President*, William Earl Hastings, Selbyville; *Treasurer*, Albert Dougherty, Wilmington; *Secretary*, Albert Bunin, Wilmington.

### KENTUCKY ASSOCIATION

The following were elected officers of Kentucky Pharmaceutical Association: *President*, Morris D Spoonamore, Danville; *Vice Presidents*, C E Montgomery, Owensboro, Emil Nehring, Covington, Oscar Votteler, Louisville; *Secretaries*, J W Gayle, Frankfort, and

H J Hafendorfer, Louisville, *Treasurer*, William J Johnson, Mayfield, *Board of Directors*, Harry Frankel, Louisville, W H Poynter, London and W H Fisher, Louisville.

### MARYLAND ASSOCIATION

Harry W Matheny, retiring president of Maryland Pharmaceutical Association, recommended the appointment of a cooperative pharmacy planning committee of the Board of Pharmacy and School of Pharmacy.

Melville Strasburger, Baltimore, was elected *President*. Other officers for the ensuing year are: A M Dewing, Centreville, *First Vice President*, A N Hewing, Baltimore, *Second Vice President*, Lloyd Richardson, Bel Air; *Third Vice President*, Harry S Harrison, Baltimore, *Treasurer*, Robert L Swain, reelected *Editor The Maryland Pharmacist*, E F Kelly, Baltimore, reelected *Secretary*, J W Westcott, Baltimore, was elected *Honorary President*.

### MARYLAND ASSOCIATION RESOLUTIONS

*Resolved*, that the Association express its profound gratitude to the AMERICAN PHARMACEUTICAL ASSOCIATION and particularly to its tireless secretary Dr E F Kelly, for having waged a successful fight for the recognition of pharmacy as a profession in the government services, and for having federal legislation enacted providing for commissions for pharmacists in the United States Army and be it

*Further resolved* that we express our confidence in the purposes and ideals of the AMERICAN PHARMACEUTICAL ASSOCIATION and pledge our best efforts in behalf of the wide range of activities which the ASSOCIATION carries on.

### MASSACHUSETTS ASSOCIATION

The following officers were elected by Massachusetts Pharmaceutical Association: *President*, Harry S Bernstein, Springfield; *First Vice President*, James L Case, East Boston; *Second Vice President*, John J Morrissey, Lawrence; *Treasurer*, Lyman W Griffin, Boston; *Secretary*, Carl G A Harring, 20 Glen Road, Newton Center; C Herbert Packard and James F Finneran were elected to the *Board of Trustees*.

### NEW JERSEY ASSOCIATION

New Jersey Pharmaceutical Association elected the following officers: *President*, Charles R Garrabrant, Passaic, *First Vice*

*President*, Emil P Martini, Hackensack, *Second Vice President*, Jerome Kahn, Caldwell, *Secretary*, Prescott R Loveland, Trenton, *Treasurer*, Charles J McCloskey, Branchville *Committee on Public Health and Welfare* (for three year terms) Carl H K Ruopp, Trenton, Edward C White, Hoboken

The New Jersey Board of Pharmacy presented Secretary R P Fischelis with a beautifully engrossed and illuminated set of resolutions in recognition of his ten years of service as secretary of the Board of Pharmacy

#### NEW JERSEY BOARD OF PHARMACY

Charles Schamach succeeds C Graham McCloskey as member of the New Jersey Board The officers of the Board are *President*, Dean B Crawford, *Vice-President*, James A Bauman, *Treasurer*, Albert J Smith, *Secretary* Robert P Fischelis

#### NEW YORK STATE PHARMACEUTICAL ASSOCIATION

The 58th annual meeting of New York Pharmaceutical Association was held June 16-19, 1936, at Bolton Landing, Lake George, N Y

Secretary Lehman reported an increase of 1517 members since last convention, making the total enrollment 6441, divided into 6321 active members, 113 life, 7 honorary Twenty-one members died during the year The treasurer reported a balance of \$14,000 00

Secretary of the New York State Board of Pharmacy, George W Mather, reported that although quite a number of new graduates had been registered during the past fiscal year, the number of licenses issued and renewed was practically the same as last year, showing that many had died or retired from business during that period

He recommended that legislation be inaugurated which will oblige the manufacturers of proprietary and secret remedies to reveal the therapeutic or active ingredients of their preparations, so as to facilitate the control of the sale of poisonous deleterious and/or habit-forming drugs under the Dunckel Law

Among the resolutions approved were the one providing for a mid winter meeting, also one asking the pharmacy law amendment so as to require a year of additional practice after graduation, one inviting the AMERICAN PHARMACEUTICAL ASSOCIATION to hold its 1937 meeting in New York City, one increasing the Executive Committee to five or seven members, requiring the registration of manufacturers of

pharmaceutical products, containing poisonous, deleterious and habit forming ingredients, reaffiliation with the N A R D

The following officers were elected *President*, Morris Brodtkin, Bronx, New York City, *First Vice President*, Edgar S Bellis, Bronxville, *Second Vice-President*, Percy Goldman, Brooklyn, *Third Vice-President*, Thos A J Rocchio, Bronx, New York City, *Secretary*, Robert S Lehman, Brooklyn, *Treasurer*, Richard A Austin, Cairo, *Chairman, Executive Committee*, Fred C A Schaefer, Brooklyn, *Honorary President*, Frederick D Ostrander, Gloversville, *Honorary Life Member*, Dr Willis G Gregory, Buffalo

Twelve very interesting papers on scientific subjects were read

#### NORTH CAROLINA ASSOCIATION

P J Suttlemyre, of Hickory, has been elected president of the North Carolina Pharmaceutical Association Others elected were C C Fordham, Jr, Greensboro, *First Vice-President*, John C Brantley, Jr, Raleigh, *Second Vice-President*, Joseph Hollingsworth, Mount Airy, *Third Vice-President*, John Mount, Chapel Hill, reelected *Secretary-Treasurer*

#### NORTH DAKOTA ASSOCIATION

The following officers were elected by North Dakota Pharmaceutical Association *President*, Andrew E Erickson, Fargo, *Vice Presidents* Philip Boise and Harry Gray, *Treasurer*, P H Costello, *Secretary*, Dean W F Sudro

#### RHODE ISLAND ASSOCIATION

Dr Edward A McLaughlin, director of the state department of public health, in his address before Rhode Island Pharmaceutical Association said that a program of greater cooperation between physicians and pharmacists would result in the writing of more prescriptions Rhode Island Association convened at Watch Hill

#### TEXAS ASSOCIATION

Immediately following the closing session of the Texas Pharmaceutical Association in San Antonio, the executive committee held a meeting At this time, L D Gilmore of San Antonio, succeeding Henry Hein of San Antonio, whose term expired, was elected *Vice-Chairman* of the executive committee

The meeting was attended by B B Dallas, *President*, Festus Pierce, C

*First Vice President*, W U Paul El Paso  
*Second Vice President*, L D Gilmore San Antonio  
*Vice Chairman*, A G Heinrichs, Houston  
 new member succeeding E B Oliver of Longview,  
 Roy Pool Amarillo, Murray Thames, Beaumont,  
 J C Frazier, Fort Worth  
 Shine Philips, Big Spring  
 W J Danforth of Fort Worth was elected *Secretary Treasurer*, he was given a vote of thanks and confidence and was instructed to continue the legislative policies of the past year

President Brown appointed a committee to consider the recommendations included in the president's address. A plan for emblems for association members and a prestige program to build up public confidence in qualified ethical pharmacists was included in the survey of the possibilities. The tentative radio plan includes a fifty-two week contract with a thirty minute program weekly containing music educational script and guest speakers from scientific professions. Dental, medical and pharmaceutical addresses are planned.

The committee instructed Secretary Danforth to issue the association bulletin semi monthly or as often as necessary during the legislative sessions. The bulletin is a mimeographed sheet containing important news of association affairs. It is sent to all members. He was also instructed to proceed with the formation of a Southwestern Conference of Pharmaceutical Associations which has been proposed. This organization a non profit, non dues association will meet annually with representatives probably the president and secretary of each state association in the five states of the Southwest to discuss matters of mutual interest to plan methods of supporting fair trade profit stabilized products. Matters of conflicting convention dates and other details will also be cared for by this group.

#### VERMONT ASSOCIATION

Vermont Pharmaceutical Association elected the following officers *President* Joseph W Blakeley Montpelier, *Vice President* Fred W Wheeler, Springfield, *Second Vice President* Albert E Cox, Hardwick, *Third Vice President* Fred Beauchamp Rutland, *Secretary Treasurer*, Lester C Chickering Brattleboro

#### VIRGINIA ASSOCIATION

President E P Berlin of Virginia Pharmaceutical Association, recommended a continuation of the organization of a legislative program. He referred to the successes of the past year

and in particular to the enactment of Virginia's fair trade law. The association held its annual session on board the *S S Reliance* en route to Bermuda.

#### WASHINGTON STATE ASSOCIATION

The following were elected officers of Washington Pharmaceutical Association *President*, Michael J Grady, Colfax, *Vice President* Roy Millett, Yakima, *Treasurer* W H Hinman Seattle *Secretary* M P Goodner Seattle

#### WISCONSIN PHARMACEUTICAL ASSOCIATION

The retiring president John F Huber advocated legislation restricting the sale of drugs to registered pharmacies and an anti peddling bill. A feature of the convention was the pharmaceutical clinic conducted by faculty members of the course in Pharmacy of the University of Wisconsin, which was followed by a professional open forum.

A certificate of merit for outstanding work in pharmacy in Wisconsin was awarded to Herman L Emmerich Milwaukee and Charles Charmley. He was given the Pharmacy Week Cup. The following officers were elected *President* A A Krygier Milwaukee *Vice President* Karl J Henrich Superior, *Second Vice President* Otis George Sparta, *Third Vice President* William Hoeschler La Crosse *Treasurer* B F Leidel Milwaukee *Secretary* Jennings Murphy Milwaukee

#### WYOMING ASSOCIATION

Wyoming Pharmaceutical Association elected the following officers *President* H H Cordiner of Laramie *First Vice President* Ira J Burleson Riverton *Second Vice President* Frank Korfanta Rock Springs *Secretary Treasurer* John B Tripeny, Casper *Place of Meeting* Casper *Time* 1937

The association has gone on record as favoring the enactment of a Fair Trade Law and a law relating to the sale control and licensing of sanitary or prophylactic products for the prevention of venereal and other diseases and infections.

#### OFFICERS OF STATE ASSOCIATIONS

**Arkansas**—*President* Harold W Lawson Little Rock, *First Vice President* William Griffin Heber Springs *Second Vice President* A L Davis Texarkana, *Secretary Manager* W Irl Brite Ben McGehee Hotel Little Rock *Treasurer*, Troy Churchman, N Little Rock

Colorado — *President*, Clyde C Phillips, Jr., Colorado Springs *First Vice-President* H Rodney Anderson, Montrose, *Second Vice-President*, Ralph E Kemp, Lafayette, *Treasurer* V N Lagerquist, La Junta *Secretary*, Charles J Clayton, Denver

Georgia — *President* Hoke S Peters Manchester *First Vice-President*, J W Brinson Wrightsville, *Second Vice-President* W W Fincher Canton, *Third Vice-President*, Bonnie Brown Lyons, *Secretary*, Z O Moore

Indiana — *President*, A J Dougherty, South Bend, *Secretary*, F V McCullough, New Albany, *Vice-Presidents* Ralph Thornburg, Syracuse and C E Reed Winchester

Maine — *President*, H W Ormsby, Houlton

*First Vice-President*, P S Demers Springvale *Second Vice-President*, Carl Anderson Bath *Third Vice-President* Frank Hargraves Mexico, *Secretary*, J H Allen Waterville *Treasurer*, George O Tuttle Portland

Oklahoma — *President* Jesse W Stunkle Enid, *First Vice-President*, B M Jones Tulsa, *Second Vice-President* Dave Mc Lemoire Britton *Secretary*, Elbert Weaver Stillwater, *Treasurer*, G C Cooper Edmond

Oregon — *President*, M C Kaegi Portland *Vice-President*, A S Keir, Hood River *Secretary*, Lawrence Stovall Portland, *Treasurer* E A Bachman, Portland, *Assistant Secretary and Manager*, J J Lynch, Portland

(To be continued)

## INVITATION

### *Members of the American Pharmaceutical Association*

Texas awaits you, Dallas will warmly welcome you and we hope you will immediately arrange your business and social affairs so as to enable you to attend the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION to be held in Dallas, Texas, August 24th-29th. Your officials are arranging a valuable program for all sections.

"In addition to all of these things arranged for you in Dallas, which include two full days of sight seeing at the Texas Centennial Exposition, a big world show, the greatest birthday party ever given.

A post-convention tour has been contracted for, probably the most economical visit ever arranged for a visit to a foreign country.

"See romantic, historic, ancient and scenic Old Mexico. When you cross the Rio Grande River into Old Mexico at Laredo you immediately pass back into the sixteenth century. You have never enjoyed a post convention tour as you will this one."

If you have not done so—write the Local Secretary, who closes his invitation and message.

"We want you in Texas, we want you in Dallas. We want you to bring the wife along make a family party of this meeting, include business with pleasure, attend your favorite convention and have a wonderful vacation and sight seeing trip, all in *One*."

W D ADAMS, *Local Secretary*

## PARTIAL TENTATIVE PROGRAMS FOR THE DALLAS MEETING

Not all of the programs of the Convention are published, but will be part of the Official Program. Some programs have been published and will *not* be repeated at this time. The Tentative Program of the American Association of Colleges of Pharmacy was printed in the May JOURNAL, pages 454-455.

The program of the Conference of Teachers of Pharmacognosy and Pharmacology was printed in the June issue of the JOURNAL, page 567.

The program of National Conference of Pharmaceutical Research was printed in the May JOURNAL, pages 456-457.

The program of the Plant Science Seminar was printed in the June JOURNAL, pages 567-568.

The General Program for the Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION and affiliated organizations, is printed in this issue of the JOURNAL, pages 644-646.

Other programs as far as completed follow. The Scientific Section so far has listed 68 papers and will be assigned in the Official Program.

# PROGRAM, SECTION ON EDUCATION AND LEGISLATION

- 1 Remarks by Chairman C Leonard O'Connell
- 2 Remarks by Vice Chairman George C Schicks
- 3 Report of Secretary George A Moulton
- 4 Reports of Standing Committees Appointment of New Committees Resolutions and Nomination
- 5 Address "Observations on Legislation" Roy B Cook
- 6 Paper 'Pharmacy's Position under Regulated Community Medicine,' P J Callaghan
- 7 Address Legislative Requirements for the Future," W Mac Childs
- 8 Paper A Novel Pharmaceutical Organization," Oscar Loddy
- 9 Paper "Foundations for Successful Legislation," George A Moulton
- 10 Paper "The Robinson-Patman Bill," Paul C Olsen
- 11 Paper "Requirements for Entrance to the Pharmacy Course," H C Christensen
- 12 Paper Legislative Weather Vanes," Robert L Swain
- 13 Paper 'Professional Pharmacy in National Legislation," E F Kelly
- 14 Paper "Some Important Obligations and Responsibilities of a College of Pharmacy," Ernest Little
- 15 Paper An Adventure in Pharmaceutical Curriculum Construction,' H C Newton
- 16 Paper High School Grades and State Board Results' H Evert Kendig
- 17 Address "Legislation and Politics" Speakers to be announced
- 18 Should High School Graduates Alone Be the Basis for College Entrants?" Robert W Rodman
- 19 'The Next Step," W T Rudd
- 20 Reports of Appointed Committees
- 21 Election of Section Officers
- 22 New Business and Adjournment

# SECTION ON PRACTICAL PHARMACY AND DISPENSING

- 1 "Is Dispensing and Preparation of Medicinal Substances a Lost Art?' Max N Lemberger
- 2 "Sterile Fluids for the Hospital and the Pharmacist," Evelyn Gray Scott

- 3 "Pharmacist and Physician," Ella Paquin
- 4 "Mal Practice of Pharmacy," E J Parr
- 5 "The Teaching of Manufacturing Pharmacy," H G DeKay
- 6 "Correct Prescription Pricing," George L Secord
- 7 "The Study of Glycerin Suppositories" William A Prout
- 8 "A Comparative Study of the Antiseptic Properties of Certain Ointments Employing Various Bases," William A Prout and Mae Strickland
- 9 "A Uniform Schedule for Prescription Pricing in South Dakota" Clark T Edsmoe
- 10 Subject to be Announced," Mac Childs
- 11 "Pharmacy in Prison" Charles L Pickens
- 12 "The Establishment and Operation of an Open-All Night Policy in a Retail Pharmacy," Herman and Robert Elich
- 13 "The Clinic Pharmacy," Josephine Nichols
- 14 'Pharmacy from the Standpoint of Hospital Administration" B T Howler
- 15 'Practical Medical Economics," Frank B Kirby
- 16 'The Color of Morphine Sulphate,' J M Ort and W G Christiansen
- 17 'The Assay of Cysteine Hydrochloride' C F Bickford and R E Schoetzw
- 18 "The Determination of Phenolphthalein in Mineral Oil Emulsions" C F Bickford and R E Schoetzw
- 19 'Fluידextract Celery Fruit N F VI," P L Burrin and F E Bibbins
- 20 "Mal-Practice of Pharmacy" E J Parr
- 21 "A Study of the Cost of Sampling" L W Rising and Einar Nygren
- 22 "Control of Specialties and Nostrums in Prescription Stock" John F McClosky
- 23 'A Preliminary Study of Tincture of Cantharides" Leslie M Ohmart
- 24 'The Challenge of Today" Anton Hogstad, Jr
- 25 'A Greater Knowledge of Pharmacology Is Essential to a Professional Pharmacist," A O Mickelsen
- 26 "The Inter-Allied Association in South Dakota" Kenneth Jones
- 27 'One Year of U S P and N F Extension in Mississippi," Charles E Wilson
- 28 The Education of a Pharmacist" Ernst T Stuhr
- 29 New Practicalities in Pharmacy" O U Sisson
- 30 'The Idealism of Pharmacy" Sister M Constance

# AMERICAN PHARMACEUTICAL ASSOCIATION

July 1936

- 31 "Adapting Modern Business to Our Code of Ethics" Frank Coniglio
- 3 Reception of Fraternal Delegates
- 4 Opening Remarks by the Chairman Roy B Cook
- 5 Appointment of Committee on Nominations
- 6 Appointment of Committee on Resolutions
- 7 Annual Report of the Council E F Kelly, *Secretary*
- 8 Report of the Treasurer, C W Holton
- 9 Report of the Secretary, E F Kelly
- 10 Reports of Delegates to Other Organizations (including International Pharmaceutical Federation, American Association for the Advancement of Science and National Drug Trade Conference)
- 11 Receipt of Resolutions, Reports and Other Communications, all of which must be in writing
- 12 New Business

## SECTION ON HISTORICAL PHARMACY

Chairman's Address  
 Secretary's Report  
 Report of Historian  
 Appointment of Nomination Committee (Place at end of first session)

### PAPERS

- 1 "Is There Anything New under the Sun?" Theodore J Bradley
- 2 "Doctor Charles Rice," John Uri Lloyd—to be presented by J T Lloyd
- 3 "Some Herb Remedies of the Aztecs" Emily Walcott Emmart
- 4 "Three 17th Century New England Pharmacists," W T Bradley
- 5 "An Interesting Old Medicine Chest," Charles Whitebread
- 6 "Verbena in Early Roman Rites," C J Zufall
- 7 "Jons Jacob Berzelius," Louis H Roddis
- 8 "A History of the Oklahoma State Board of Pharmacy," William G Bray
- 9 "A History of the University of Oklahoma School of Pharmacy," William G Bray
- 10 "A History of Oklahoma State Pharmaceutical Association," Wm G Bray
- 11 "What Difference Does a Century Make?" John E Kramer
- 12 "J Meyenberg, Drugs," Margaret Cousins
- 13 "Reverchon, Texas Botanist," Margaret Cousins
- 14 "Knowing the History of One's Profession, II" C O Lee
- 15 "The Literary Pharmacopœia of Scott," Edward Kremers
- 16 "Chuck Wagon Therapy," Walter Cousins
- 17 "A Memorial Hour," contributors—James H Beal and others H V Army in charge Time to be selected

Second Session, Wednesday, August 26, 1936,  
 8 00 P M

- 1 Roll Call of Delegates
- 2 Reading and Adoption of the Minutes of the First Session
- 3 Receipt of the Address of the President of the AMERICAN PHARMACEUTICAL ASSOCIATION
- 4 Receipt of Reports and Other Communications from the Association Council and Sections
- 5 Receipt of Resolutions, Reports and Other Communications all of which must be in writing
- 6 Reports of the Committees on Cosmetics H C Muldoon, on Pharmacy Week Anton Hogstad, Jr, on Council on Pharmaceutical Practice, E F Cook, to Study the By-Laws R L Swain on Pharmacy Corps in the U S Army H E Kendig on Prescription Tolerances, H H Schaefer, on Development of Pharmacy Laws and Restrictive Legislation, R L Swain, on Professional Relations, L A Seltzer on A PH A Branches Adolph Ziefle, on Legislation, E F Kelly, on Membership, E F Kelly
- 7 Election of the Honorary President Secretary and Treasurer of the ASSOCIATION upon nomination by the Council
- 8 Report of the Committee on Nominations
- 9 Report of the Committee on Place of Meeting

PROGRAM SESSIONS OF THE A PH A  
 HOUSE OF DELEGATES, DALLAS,  
 TEXAS

First Session, Tuesday, August 25, 1936,  
 1 30 P M

- 1 Call to Order
- 2 Roll Call of Delegates

- 10 Report of the Committee on Resolutions
- 11 Unfinished Business

**Third Session, Friday, August 28, 1936,  
2 00 P M**

- 1 Roll Call of Delegates
- 2 Reading and Adoption of the Minutes of the Second Session
- 3 Receipt of Reports and other Communications from the ASSOCIATION, Council and Sections
- 4 Reports of the Committees on Weights and Measures, M N Ford, on Study of Pharmacy, R P Fischelis, on U S Pharmacopoeia, C C Glover, on Pharmaceutical Syllabus, J C Beard, on Horticultural Nomenclature, H W Youngken, on Physiological Testing, J C Munch, on William Procter, Jr, Memorial Fund, J E Hancock, on International Pharmaceutical Nomenclature, A G DuMez, on Press Relations, R W Rodman, on Prerequisite Legislation, C B Jordan, on Endowment Fund, Wm B Day, on Study Courses in the History of Pharmacy C O Lee, on Professional Information Pertaining to Dental Pharmacy, Geo C Schicks, on Transportation T J Bradley
- 5 Final Report of Committee on Resolutions
- 6 Unfinished Business
- 7 Installation of the Chairman and Vice-Chairman of the House of Delegates
- 8 Final Adjournment

**PROGRAM CONFERENCE OF  
PHARMACEUTICAL LAW  
ENFORCEMENT OFFICIALS**

**First Session, Monday, August 24, 1936,  
9 00 P M , Second Session, Thursday,  
August 27, 1936, 9 00 A M**

- 1 Call to Order
- 2 Remarks by Chairman, Robert L Swain
- 3 Report of Secretary, M N Ford
- 4 Report of Finance Committee
- 5 Appointment of Conference Committees
- 6 Pharmacy Law Enforcement in the Following States  
Texas—Walter H Cousins  
Kansas—Pat Mulligan  
Mississippi—T C McMillion  
Arkansas—W H Parker  
Alabama—Samuel A Williams  
Arizona—L Evans, Jr  
New Mexico—George Sasser  
Louisiana—John E Guess

Oklahoma—Edward Milligan  
Minnesota—Edward J Prochaska  
(Mr Prochaska will lay special emphasis on law enforcement and mail order houses)

- 7 The Administration of the Minimum Equipment Law in  
New Jersey—Robert P Fischelis  
New York—George W Mather  
Virginia—A L I Winne  
Kansas—Mac Childs  
Maryland—Robert L Swain
- 8 The Sale of Drugs and Medicines in New York State George W Mather, Secretary New York Board of Pharmacy
- 9 Have Boards of Pharmacy Discretionary Powers in the Matter of Granting Permits for the Operation of Retail Pharmacies? Kenneth Jones South Dakota
- 10 Discussion of Legislation Affecting the Control of Pharmacies Pharmacists and the Manufacture and Distribution of Drugs and Medicines and Other Topics of Special Interest to Enforcement Officials
- 11 Discussion of the Powers of Inspection Vested in Boards of Pharmacy
- 12 A Discussion of the Advisability of Setting a Standard for Drug Stores in Which Practical Experience May Be Obtained—New York—George W Mather  
New Jersey—Robert P Fischelis
- 13 What Can Be Done to Regulate the Sale of Proprietary Medicines?—Hugo H Schaefer
- 14 What Can Be Done to Prevent Drugs and Medicines from Being Marketed under Fictitious Firm Names?—West Virginia—Roy B Cook

**TENTATIVE PROGRAM N A B P  
CONVENTION**

**First Session, Monday, August 24, 9 30 A M —  
Ball Room**

- 1 Call to Order President Mac Childs
- 2 Roll Call
- 3 Appointment of Committee on Credentials, President Mac Childs
- 4 President's Address Mac Childs
- 5 Appointment Committee on President's Address
- 6 Report of Secretary H C Christensen
- 7 Report of Treasurer J W Gayle
- 8 Appointment of Nominating Committee, President Childs
- 9 Report of Executive Committee Clare Allan, *Chairman*

- 10 Presentation of Suggested Amendments to Constitution and By-Laws, Walter Varnum

Second Session, Monday, August 24, 1 30 P M —Ball Room

- 1 Report of Advisory Examination Committee H C Christensen, *Chairman*
- 2 Report of Syllabus Committee
- 3 Report of Legislation Committee, G A Moulton, *Chairman*
- 4 Report of Committee on National Legislation, Robert L Swain, *Chairman*
- 5 Report of Committee on Prerequisite Legislation, C W King, *Chairman*
- 6 Report of Publicity Committee Hugh P Beirne, *Chairman*
- 7 Report of Grievance Committee, M N Ford, *Chairman*
- 8 Report of Committee on National Certificate, H C Christensen, *Chairman*
- 9 Report of Committee on Minimum Standards of Technical Equipment, A C Taylor, *Chairman*
- 10 Report of Committee on Pharmaceutical Jurisprudence, Roy B Cook, *Chairman*
- 11 Report of Committee on Code Matters, Robert L Swain, *Chairman*
- 12 Report of Banquet Committee, Walter H Cousins, *Chairman*

N A B P Banquet, Monday, August 24, 6 30 P M —Palm Garden

JOINT SESSION WITH AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

Tuesday, August 25, 9 00 A M —Ball Room  
Program not ready yet—details later

Final Session, Tuesday, August 25, 1 30 P M —Ball Room

- 1 Reports of Vice-Presidents
  - District No 1, Vice President George A Moulton
  - District No 2, Vice-President John M Woodside
  - District No 4, Vice President Earl Durham
  - District No 6 Vice President Emmett Weaver
  - District No 7, Vice President R C Shultz

- 2 Report of Committee on President's Address
- 3 Report of Department of Education, R L Swain, *Director*
- 4 Report of Committee on Constitution and By-Laws, Walter Varnum, *Chairman*
- 5 Report of Resolutions Committee, A C Taylor, *Chairman*
- 6 Reports of Special Committees
- 7 Unfinished business
- 8 New Business
- 9 Report of Nominating Committee
- 10 Election and Installation of Officers
- 11 Adjournment

CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES

The Conference of Pharmaceutical Association Secretaries will devote its time to round table discussion of timely topics. The following subjects have been suggested but the list will undoubtedly be augmented before the opening of the convention.

- 1 Will State Fair-Trade Acts solve the problem of price stabilization?
- 2 The importance of State Association Bulletins, and how to handle them
- 3 Where geographical conditions permit should district meetings be held throughout the year?
- 4 Certain states have the problem of powerful city associations overshadowing the state associations and as a result have poorly attended state conventions, what can be done about it?
- 5 What can be done to increase the attendance at our conferences?
- 6 Would it be feasible to build up a manual of fundamentals of secretarial activities?

SOUTH DAKOTA RESOLUTIONS

Among the resolutions passed at the South Dakota meeting are the following:

- The endorsement of a fair trade act for passage at the next session of legislature
- Commendation of the action of the State Board of Pharmacy in recent litigations
- Endorsing the recommendations of President Daniels in their entirety
- Expressing appreciation for the continued support accorded the association by the School of Pharmacy in Brookings
- Recommending the Robinson Patman Bill and the Tydings Fair Trade Enabling Act



Reendorsing the Interprofessional Council and recommending another Interallied Professional meeting to be held in conjunction with the state association convention

Endorsing the officials of the N A R D and of the A P H A

Commending the outstanding work done by the prescription pricing committee

## NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E G Eberle, 2215 Constitution Ave, N W, Washington, D C

All manuscripts should be typewritten in double spacing on one side of paper  $8\frac{1}{2} \times 11$  inches and should be mailed in a flat package—not rolled The original (*not* carbon) copy should be sent The original drawings, not photographs of drawings, should accompany the manuscript Authors should indicate on the manuscript the approximate position of text figures All drawings should be marked with the author's name and address

A condensed title running page headline, not to exceed thirty-five letters should be given on a separate sheet and placed at the beginning of each article

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department, School or College The date when received for publication should be given

Numerals are used for figures for all definite weights, measurements, percentages and degrees of temperature (for example 2 Kg, 1 inch, 20.5 cc,  $300^{\circ}$  C) Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago about two and one half hours seven times)

Standard abbreviations should be used whenever weights and measures are given in the metric system, e g, 10 Kg, 2.25 cc, etc The forms to be used are cc, Kg, mg, mm L and M

Figures should be numbered from 1 up, beginning with the text figures (line engravings are always treated as text-figures and should be designed as such) and continuing through the plates The reduction desired should be clearly indicated on the margin of the drawing All drawings should be made with India ink, preferably on white tracing paper or cloth If coördinate paper is used a blue lined paper must be chosen Usually it is desirable to ink in the large squares so that the curves can be more easily read Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches) Photographs intended for half tone reproduction should be securely mounted with colorless paste

Figure " should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to "Fig," per cent—2 words

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author

References to the literature cited should be grouped at the end of the manuscript under the *References* The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses) The sequence followed in the citations should be Author's name (with initials) name of publication volume number, page number and the date in parentheses Abbreviations for journals should conform to the style of *Chemical Abstracts*, published by the American Chemical Society

(1) Author, A Y, *Am J Physiol* 79 289 (1927)

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Editor will appreciate comments from Board of Review and Committee on Publication, members authors and others interested

*Errors in programs changes and additions will be made in Official Program*

